United States
Department of
Agriculture

Lewis and Clark
National Forest Plan
P.O. Box 871
Great Falls, Mt. 59403

Lewis & Clark National Forest Plan Draft Environmental Impact Statement

Middle Fork Judith and Big Snowies Wilderness Study Report

Photo: Crystal Lake in the Big Snowy Mountains.

DRAFT ENVIRONMENTAL IMPACT STATEMENT

The Lewis & Clark National Forest
Land and Resource Management Plan

Type of Action:	Administrative
Responsible Federal Agency:	Forest Service, USDA
Responsible Official:	Tom Coston, Regional Forester Northern Region USDA - Forest Service Federal Building Missoula MT 59807
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Abstract: This Draft Environmental Impact Statement describes the preferred alternative and other alternatives, including a "no action" alternative, for managing the land and resources of the Lewis and Clark National Forest. The land area involved is 1,843,395 acres. Recommendations are also made on the Middle Fork Judith and Big Snowies Wilderness Study Areas.

The alternatives provide different mixes of management resulting in different levels of goods and services. The environmental consequences for the preferred alternative and other alternatives are displayed.

The opportunity to request an administrative review of an environmental impact statement and Forest Plan is limited by the National Forest Management Act regulations to those who participate in the process and to the issues they raise.

Comments regarding this statement should be sent to the Forest Supervisor, Lewis and Clark National Forest, P.O. Box 871, Great Falls, Montana 59403. by October 31, 1982.

Date of Transmission to Environmental Protection Agency and to the Public: July 26, 1982.

INTRODUCTION

This environmental impact statement is written in two sections. Section 1 deals with the Forest Plan. Section 2 deals with the Montana Wilderness Study Act areas.

The environmental impact statement contains a summary and seven chapters. The chapters are:

Chapter I, Purpose of and Need for the Proposed Action, describes the planning process and the legislative framework behind the Forest Plan. The Resources Planning Act (RPA), the relationship between RPA, the Regional Plan, the Forest Plan, RARE II, and the Montana Wilderness Study Act are all discussed.

A brief and general description of the Lewis and Clark National Forest, its two divisions, the Rocky Mountain and Jefferson, and the mountain ranges they contain is also covered. Public issues and management concerns addressed in the Plan are listed and discussed.

Chapter II, Alternatives Considered, examines each of the alternatives analyzed in the planning process including the Current Plan and the Preferred Alternatives. Comparisons are made between each of the alternatives considered as they relate to the resources of the Lewis and Clark National Forest.

Chapter III, Affected Environment, describes in detail the various physical, biological, social, and economic environments that would be affected by the Forest Plan.

Chapter IV, Environmental Consequences, forms the scientific and analytical basis for the comparison of the alternatives.

In Section 2, Chapters I, II, III, and IV are repeated for the areas requiring special study under the Montana Wilderness Study Act.

Chapter V, List of Preparers; Chapter VI, List of Persons, Agencies, and Organizations to Whom Copies of Statement are Sent; Chapter VII, Index; and the Appendices are self-explanatory.

Throughout this environmental impact statement reference is made to more detailed documents available at the Lewis and Clark National Forest Supervisor's Office. Appendix A lists those planning documents that are available on request.

Other documents are available for review during normal business hours (8:30 am to 4:30 pm, weekdays except holidays) at the Supervisor's Office; 1601 2nd Avenue North; Great Falls, Montana. Requests for copies of available planning records should be sent to:

Lewis and Clark National Forest
P.O. Box 871
Great Falls, MT 59403

VIRGIN STAND OF LODGEPOLE PINE IN LITTLE BELT MOUNTAINS.

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SUMMARY

Overview

The first part of this Summary describes the planning process, legislative framework, and gives a general description of the Forest. The second part describes the analysis of the management situation, lists benchmarks, alternatives that were eliminated from further study, and alternatives that were considered in detail. Table S.1 shows the allocation of land by management emphasis. Table S.2 shows the resource production and effects by alternative. Next comes a summary of the alternatives. The last part of this Summary describes the environmental consequences of each alternative.

These parts are repeated for the Middle Fork Judith and Big Snowies Wilderness Study Areas.

A more detailed description of these actions can be found in the DEIS (Draft Environmental Impact Statement) for the Lewis and Clark Forest Plan.

Detailed information of the management of the Lewis and Clark National Forest under the Preferred Alternative can be found in the Lewis and Clark Proposed Forest Plan.

These documents are available for review at all Lewis and Clark offices located at Augusta, Choteau, Stanford, Harlowton, White Sulphur Springs, Belt Creek, and Great Falls. Request for copies of the DEIS or Proposed Forest Plan should be sent to:

Lewis and Clark National Forest
P.O. Box 871
Great Falls, MT 59403

PLANNING PROCESS

SUMMARY

Background

In 1976, Congress passed the NFMA (National Forest Management Act), an amendment to the RPA (Forest and Rangeland Renewable Resources Planning Act) of 1974. This Act requires each National Forest to formulate an intergrated plan, incorporating guidance for all natural resource management activities.

The preparation of an EIS (environmental impact statement) is required by the National Environmental Policy Act, Council of Environmental Quality regulations, and the implementing regulations of the National Forest Management Act.

Forest planning occurs within the overall framework of both national and Regional planning as structured by the laws cited above and their implementing regulations. Through the National RPA Program, the Region establishes management standards and guidelines, attempts to resolve regionally significant issues and concerns, and distributes RPA goals to the Forests within the Region. The question of achieving goals assigned and addressing local area issues and concerns is addressed in the Forest planning process.

PLANNING PROCESS

Planning Process

The planning process, outlined in implementing regulations of the National Forest Management Act, was followed to develop the proposed action. The planning actions, as specified in the regulations and used in the Forest Planning process, are:

1. Identification of issues, concerns, and opportunities
2. Development of planning criteria
3. Inventory of data and information collection
4. Analysis of the management situation
5. Formulation of alternatives
6. Estimated effects of alternatives
7. Evaluation of alternatives
8. Selection of the preferred alternative
9. Implementation
10. Monitoring and evaluation

Remaining Process

This DEIS has been prepared and circulated for comment after completion of planning actions 1 through 7. As part of planning action 7, a preferred alternative is shown in the DEIS and is the basis for the Proposed Lewis and Clark National Forest Plan. After the close of the comment period, planning actions 1 through 7 will be repeated to the extent necessary and a FEIS (Final Environmental Impact Statement) will be prepared, filed with the Environmental Protection Agency, and made available to the public. The Regional Forester will use the FEIS in making a decision under the National Forest Management Act on a plan of management for the Lewis and Clark National Forest. This decision will be documented in a Record of Decision which will be available to the public.

Planning Records

All of the documents and files (planning records) containing the results of the Forest planning process are available for inspection during regular business hours at the Lewis and Clark National Forest Supervisor's Office, 1601 2nd Avenue North; Great Falls, Montana. Appendix A lists those planning records that are available on request. These planning records contain the detailed information and decisions used in developing the Forest Plan as required in NFMA regulations. The planning records are incorporated by reference at appropriate points in the text and appendices of the DEIS and Forest Plan.

LEGISLATIVE FRAMEWORK

FOREST SERVICE PLANNING

Wilderness Study

The Forest contains three wilderness study areas: Middle Fork Judith, Big Snowies, and Deep Creek-Reservoir North. As part of the Forest planning process, the Regional Forester is making preliminary recommendations on the Middle Fork Judith Wilderness Study Area and the Big Snowies Wilderness Study Area. Wilderness studies on these lands are required by the MWSA (Montana Wilderness Study Act) of 1977 (Public Law 95-150).

Section 1 of this Summary discloses the effects of managing the study areas under various alternatives on a Forest-wide basis in compliance with NFMA. Section 2 summarizes the evaluation of the study areas on an individual basis in compliance with the Wilderness Act and MWSA.

Note: Any recommendations for the MWSA areas are preliminary administrative recommendations which will receive further review and possible modification in the offices of the Chief, the Secretary of Agriculture, and the President. Congress has reserved the right to make final decisions on wilderness designation.

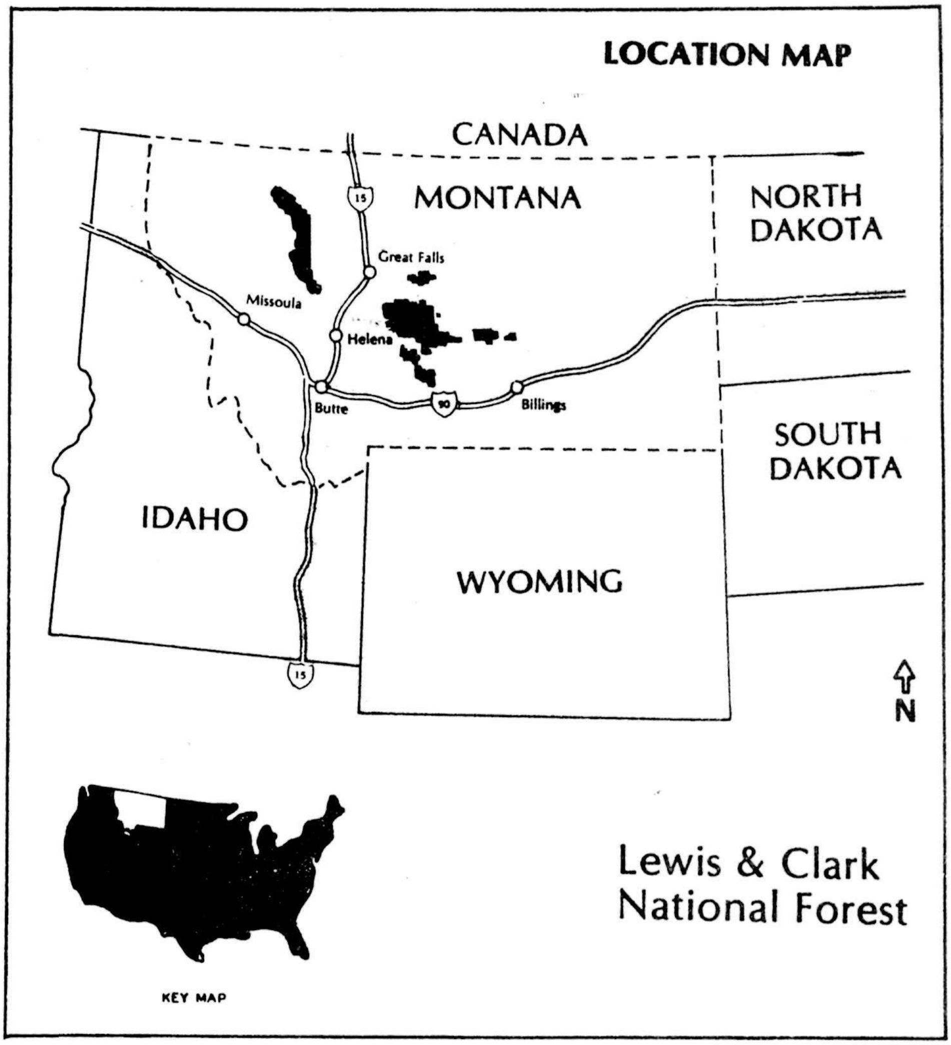
The Regional Forester will not make a recommendation on the Deep Creek-Reservoir North Wilderness Study Area until oil and gas potential for that area has been determined.

The three wilderness study areas will be managed, subject to existing private rights and uses, to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System until Congress determines otherwise.

GENERAL AREA

GENERAL DESCRIPTION

The Lewis and Clark National Forest is located in north-central Montana within the upper Missouri River system. Historically, the Forest has been referred to by two major divisions: the Rocky Mountain Division containing the Rocky Mountain Ranger District, and the Jefferson Division containing the Judith, Musselshell, and Kings Hill Ranger Districts.


LOCATION MAP
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NORTH DAKOTA
SOUTH DAKOTA
IDAHO
WYOMING
Great Falls
Missoula
Helena
Butte
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KEY MAP
Lewis & Clark National Forest

ALTERNATIVE FORMULATION

Alternative formulation, planning action 5, resulted from a systematic set of interrelated actions beginning at the start of the planning process. In particular, planning actions 1 through 4, listed in Chapter I. The following discussion presents these actions in more detail.

Planning Action 1 - Identification of Issues, Concerns and Opportunities

Public issues and opportunities for management were identified through public involvement efforts, coordination with other Federal agencies, State agencies, local governments, and the Blackfeet Indian Tribe. Forest Service management concerns were added to the issues and opportunities. These issues and concerns are listed in Chapter I. Details on the process used to develop issues, concerns, and opportunities are available in the planning record, "Identification of Public Issues and Management Concerns".

Planning Action 2 - Development of Planning Criteria

Criteria were established to guide the planning process to give and management direction. Process criteria for the collection of inventory data, analysis of the management situation, and the formulation of alternatives were developed by the interdisciplinary team. Process criteria are documented in the planning record, "Proposed Criteria and Documentation."

Planning Action 3 - Inventory of Data and Information Collection

Using resource inventories, a comprehensive data base was formed including landform, soils, wildlife, and vegetation information. Details on contents of the data base are contained in the planning record, "Data Base Components". Social and economic data on population, employment, income, and education for the counties directly affected by the Forest are available in the planning record, "Social Impact Assessment Baseline, 1980".

Planning Action 4 - Analysis of the Management Situation

The analysis of the management situation included identification of feasible ranges of goods, services, and uses; projected use levels; potential to resolve issues and concerns; the feasibility of providing the levels of goods, services, and uses resulting from assigned RPA objectives. This analysis identified the opportunity to change management direction.

Planning Action 5 - Formulation of Alternative

Alternatives list different ways to address and respond to the major public issues, management concerns, and resource opportunities. Alternatives result from planning actions 1 through 4 and are documented in the planning record, "Alternatives".

BENCHMARKS

During the Analysis of the Management Situation, resource supply potentials were determined, using various objectives, constraints, and assumptions in FORPLAN. Single resource minimum and maximum supply potentials were established for timber, range, wildlife, and recreation. In addition, production capabilities were determined for a set of multiple resource outputs that maximize present net value. This analysis established the "benchmark" levels required by national planning direction. Three types of benchmarks were developed for the Lewis and Clark National Forest. They are:

> Minimum level benchmark - displays the minimum outputs associated with custodial management of the Forest and the unavoidable costs and benefits of public ownership.
>
> Maximum present net value benchmark - maximizes present net value for the Forest and displays the associated resource outputs.
>
> Resource benchmarks - defines the maximum potentials for each resource. They include maximization of timber, range, wildlife, and recreation.

Selected benchmarks were used to define the upper and lower limits for the production of each resource. The interdisciplinary team considered demand, supply potential (upper and lower limits), and economic characteristics to establish the range of alternatives. Opportunity costs were determined by comparing alternatives with the maximum PNV benchmark.

ALTERNATIVES DEVELOPED

The alternatives to be considered in detail and those eliminated from detailed study were identified after completing the analysis of the management situation. The preceding comprehensive benchmark analysis prevented the formulation of alternatives that could not be implemented. Even though a large number of alternatives could have been developed, effort was concentrated in developing a reasonable range of alternatives that could be analyzed within the limits set by the capability of the Forest and that were responsive to public issues and management concerns.

ALTERNATIVES ELIMINATED FROM DETAILED STUDY

The Forest developed and examined several alternatives that were eliminated from detailed analysis. No alternatives were formulated with timber and grazing outputs significantly below current levels. Output levels lower than the current levels were considered during alternative formulation and dismissed. Demands, social and economic implications, and impacts to other resources were considered in the analysis of the management situation.

Timber harvest levels much below 13 million board feet (current level) would have great impacts on the stability of timber dependent communities. The demand for Forest timber will increase over time, because the supply of private timber is decreasing. A reduction in volume would have little positive effect on other resources except semi-primitive recreation. Grazing levels below 72,000 animal unit months (current levels), likewise, would have a great impact on the stability of local ranches.

Wilderness Alternatives

NFMA regulations specify that lands reviewed in the Roadless Area Review and Evaluation (RARE II) Final Environmental Impact Statement and not designated as wilderness or for wilderness study will be managed for uses other than wilderness. No such area will be considered for designation as wilderness until the Forest Plan is revised.

Public Workshop Alternatives

The Forest developed six alternatives from public responses at a series of public workshops (see planning record, "Alternatives from Public Involvement," for details on process and results).

Two of the six alternatives became Alternatives A and C, and three others are similar to Alternatives B and C. The variations of Alternatives B and C from the public workshop alternatives centered on oil and gas leasing that the Forest had already made a decision on before completion of the Forest Plan. Because the three workshop alternatives could be represented by B and C without the oil and gas segments, they were considered as Alternatives B and C in detailed study.

The sixth public workshop alternative was eliminated from detailed study. This alternative called for a high level of timber harvest with a moderate level of grazing and minerals while maintaining dispersed recreation, developed recreation, wildlife habitat, and soil and water quality.

Based on the analysis of the management situation, maintaining wildlife habitat (particularly for big game) at the present level would not be possible with a high level of timber harvest and a moderate level of grazing. Therefore, this alternative was eliminated from detailed study. Also, other alternatives such as A, B, and E reflect similar outputs for range and timber, but these do have decreases in wildlife habitat which allow them to be feasible alternatives.

Management Team Alternatives

In addition to the alternatives identified from the public workshops, several others were added by the Forest management team. Alternatives D, E, and F were all studied in detail. Two other alterntives, RPA Low Bound and Departure to Reduce Timber Loss, were eliminated from detailed study.

RPA Low Bound

The RPA Low Bound alternative called for the Forest to follow the low bound outputs recommended in the 1980 RPA Assessment. The Revised President's Statement of Policy of December 1980 accepted only the high bound outputs as the Recommended Program. This alternative was eliminated from detailed study after that policy was released because it considered only low bound outputs.

Departure to Reduce Timber Loss

A significant loss of timber could result from epidemic infestations of the mountain pine beetle and associated mortality of lodgepole pine. An alternative was developed to test the feasibility of preventing catastrophic losses by harvesting highly susceptible trees before they are infested. This alternative departs from non-declining sustained yield.

This alternative would result in large volumes of timber being harvested over the first 4 decades at the same rate as the maximum timber benchmark. However, other resources such as wildlife habitat and semi-primitive recreation would be impacted adversely from large amounts of land being roaded and vegetation successional stages changed. For these reasons, this alternative was not considered for further detailed analysis.

ALTERNATIVES CONSIDERED IN DETAIL

NFMA regulations specify that a no-action alternative be developed. No action represents the most likely condition expected to exist in the future if the current plan were to continue unchanged. The current plan is the no-action alternative and is a basis for comparing all other alternatives.

Current Plan
(No Action Alternative)

Management activities on the Forest are presently guided by Ranger District Multiple-Use Plans and Part I of the Forest Multiple-Use Plan. These plans emphasized delineation of management zones and developed coordination requirements to resolve land use conflicts. Since these plans were put into effect, legal changes and the RARE II (Roadless Area Review and Evaluation) have altered management direction in the following ways:

- The Scapegoat and Great Bear Addition to the Bob Marshall have been added to the National Wilderness Preservation System;
- Renshaw and Silver King-Falls Creek areas have been recommended for wilderness classification;
- Deep Creek-Reservoir North has been designated as a further planning area and will not be addressed in this plan until further information is available; and
- Middle Fork Judith and Big Snowies have been designated as wilderness study areas by the MWSA (Montana Wilderness Study Act).

In addition, advances in technical knowledge have made it possible to determine more precisely the lands capability.

Under the current plan, the Forest produces a low level of timber products and a moderate level of livestock grazing. Currently, the Forest is producing 13 million board feet of timber and 72,300 AUMs (Animal Unit Months) of domestic grazing. Providing road access to undeveloped lands is emphasized. Wildlife habitat improvement is at a low level. Developed recreation opportunities would remain static; maintenance of these facilities is at a reduced service level. Over 456,000 acres have been leased or recommended for leasing for oil and gas exploration and development. Wilderness study areas are managed to protect their wilderness characteristics.

Alternative A

The goal of this alternative is to meet RPA (Resource Planning Act) objectives. This alternative meets the direction in the "Revised President's Statement of Policy" which states that, "at least one alternative in the EIS will be developed to determine how the 1980 RPA (Forest and Rangeland Renewable Resources Planning Act) Program could be best implemented on the Forest."

The RPA Recommended Program for the Forest emphasizes high levels of timber harvest and livestock grazing accompanied by increases in roads for accessibility. Under this alternative, by 2030, 41.0 million board feet of timber would be harvested. Grazing would increase from 72,300 AUMs to 86,400 AUMs. There would be a decrease in elk and catchable trout populations; the wildlife habitat improvement program would triple. Developed recreation would increase about 32,000 RVDs (Recreation Visitor Days) by 2030. Although RPA objectives for dispersed recreation have already been met by the current management, dispersed recreation opportunities in a roaded natural appearing setting would increase significantly.

The Forest would recommend standard stipulation on additional oil and gas leases to protect surface resource values. This alternative would help meet the Nation's demand for renewable and nonrenewable resources.

Alternative A-1 and A-2

MWSA areas would be either (A-1) recommended for wilderness classification or (A-2) managed with the rest of the Forest as described above.

Alternative B

The goal of this alternative is to increase the use of Forest resources while maintaining a variety of dispersed recreation opportunities.

Timber harvest and livestock grazing would increase to the midpoint between current management and the RPA Recommended Program. Under this alternative, by 2030, 23.7 million board feet of timber would be harvested. Grazing would increase from 72,300 AUMs to 81,400 AUMs. In emphasizing timber and grazing, corresponding emphasis on dispersed recreation opportunities in a roaded natural appearing setting would result. Select areas in a semi-primitive recreation setting would be maintained. Developed recreation would be at the current level of 198,000 RVDs. Wildlife habitat would not be stressed; rather, it would be dependent on timber and range developments.

The Forest would continue to recommend non-surface occupancy, limited surface use, and timing restrictions on all oil and gas leases.

Alternative B-1 and B-2

MWSA areas would be (B-1) recommended for wilderness classification or (B-2) managed with the rest of the Forest as described above.

Alternative C

The goal of this alternative is to stress the Forest's abundant wildlife resource. Wildlife habitat would be maintained and improved. Both developed and dispersed recreation opportunities would increase. By 2030, an additional 15,000 RVDs of developed recreation would be provided. Most semi-primitive recreation opportunities would be maintained. Timber harvest would be slightly less than the current level of 13 million board feet; however, timber harvesting would be precluded in areas that are currently in a semi-primitive setting.

Additional oil and gas leasing with surface occupancy would be recommended only on areas which are currently accessible and which are not extremely sensitive. Timing restrictions would be recommended on most additional oil and gas leases to protect wildlife.

Livestock grazing would remain at the moderate level, but grazing would be allocated only if wildlife habitat objectives can be fully met.

MWSA areas would be managed for semi-primitive recreation and wildlife habitat, especially elk habitat, through habitat improvement practices.

Alternative D

The goal of this alternative is to respond to the increasing national and local demand for livestock grazing and outdoor recreation.

Livestock grazing would be increased to its maximum useable level of 90,000 AUMs. Dispersed recreation in a semi-primitive and roaded natural appearing setting would be emphasized. Many semi-primitive recreation opportunities would be maintained. Timber harvest would be precluded in these areas.

No-surface occupancy or limited surface use would be recommended for all additional oil and gas leases. Developed recreation opportunities would increase by 32,000 RVDs by 2030. To increase transitory range, timber would be harvested, at slightly less than the current level of 13 million board feet.

MWSA areas would be managed with the rest of the Forest as described above.

Alternative E

The goal of this alternative places emphasis on obtaining commodities where best suited.

The Jefferson Division would provide a high level of timber harvest and domestic grazing, accompanied by increases in roads for accessibility. Under this alternative, by 2030, 33.1 million board feet of timber would be harvested. Grazing would increase from 72,300 AUMs to 84,400 AUMs.

Dispersed recreation in a roaded natural setting would be emphasized. Developed recreation in the Jefferson Division would increase by 4,000 RVDs by 2030. The Forest would recommend standard stipulations on additional oil and gas leases to protect surface resource values.

In the Rocky Mountain Division, non-extractive uses such as wildlife habitat and semi-primitive recreation would be stressed. Timber would not be harvested on a regulated basis. The Forest would continue to recommend no-surface occupancy, limited surface use, and timing restrictions on all oil and gas leases in the Rocky Mountain Division.

Alternative E-1 and E-2

MWSA areas would be either (E-1) recommended for wilderness classification, or (E-2) managed with the rest of the Forest as described above.

Proposed Action —
Alternative F

The goal of this alternative is to increase the use of Forest resources and maintain dispersed recreational opportunities in a semi-primitive setting.

Developed recreation would increase by 32,000 RVDs by 2030.

Timber harvest and domestic grazing levels would be at a moderate level. By 2030, 24 million board feet of timber would be harvested. Timber harvest activities would be programmed only in those areas where extensive investments in roads would be commensurate with the values to be removed.

Livestock grazing would increase from 72,300 AUMS to 78,200 AUMs by 2030. Adverse impacts on wildlife habitat would be minimized through coordination. However, some increases in livestock grazing would occur on big game winter ranges and riparian zones.

The Forest would continue to recommend no-surface occupancy, limited surface use, and timing restrictions on most oil and gas leases.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed partly for commodity production and partly for semi-primitive recreation.

Departure

NFMA regulations allow a forest to depart from non-declining sustained yield if certain conditions are met. One of these conditions is high mortality losses from any cause that can be significantly reduced or prevented. A significant loss of timber could result from epidemic infestations of mountain pine beetle and associated mortality of lodgepole pine.

An alternative considered was departure from the Preferred Alternative. This departure alternative is different than the departure alternative that was not considered in detail. In this alternative the timber would increase to 28.1 million board feet by the fourth decade and then decline to the long-term sustained yield of the Preferred Alternative of 25.4 million board feet after that decade.

No departure schedule is recommended because it does not appear to provide the greatest net public benefit at this time.

Implementation of a departure schedule would require immediate increases in funding for collector roads, new road rights-of-ways, and personnel. Since the Forest lands have a lower timber productivity than some other Forests in the Region and nation, the higher costs to increase timber harvest would limit the Forest's ability to compete with other Forests for additional funds.

Lumber market conditions have not indicated a demand to support departure. There are no new sawmills proposed or any expansion planned at the existing sawmills within the local submarket area.

Management of other resources does not support the need to make the tradeoffs required for departure. Semi-primitive recreation setting by 2030 would decrease by 255,000 acres over the preferred alternative. The amount of acres for the modification visual quality objective would increase.

Alternative Allocation and Output Summary

The allocation of land to management emphasis by alternative is shown in Table S.1. A summary of resource production and effects for the alternatives and shown in Table S.2.

Alternative Testing

Even within an alternative considered for detailed analysis, there was usually more than one way to accomplish the objectives of the alternative. Different ways to meet those objectives were reviewed and tested by the Forest management team, interdisciplinary team, and other Forest personnel to ensure that the alternative met on-the-ground conditions and best fit the management objectives for the alternatives. Maximum PNV was used to test variations within alternatives to ensure economic efficiency.

Further information on all alternatives is on file at the Forest Supervisor's Office.

Alternative Maps

Maps of each of the alternatives considered in detail can be found in the document, "Lewis and Clark National Forest Plan - Maps." Alternative maps show areas where timber harvest and additional road construction activities may occur, areas of concentrated dispersed recreation, and areas of special visual concern. Also listed is the allocation of land to management emphasis by mountain range.

TABLE S . 1 ALLOCATION OF ACRES TO MANAGEMENT EMPHASIS BY ALTERNATIVE

	MIN LEVEL	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)	MAX TIM	MAX PNV
Min. Level Mgmt	1395045	605583	383240	456162	431955	560976	695309	748053	435155	497565	849637	827343	670818	686935
Range Mgmt	0	294191	153427	181611	217514	258338	252480	297133	198350	221457	131242	131730	23532	23532
Timber Mgmt	0	179081	289260	347444	358862	400277	163034	180207	311129	417264	157676	183330	533129	456276
Timber/Range Mgmt	0	12364	132469	128347	56421	50241	40440	46663	55112	59545	127020	123997	110037	85073
Timber/Wildlife Visual Mgmt	0	4087	37386	63057	36890	15048	5725	10810	66331	55907	1346	645	2904	83287
Timber/Range/Wildlife/Visual Mgmt	0	0	6513	2824	633	519	0	1443	1479	1497	0	0	0	0
Wildlife Mgmt	0	52193	117673	120588	43138	48955	154200	43800	67932	71457	62028	60851	0	310
Wildlife/ Range Mgmt	0	221	28111	35743	2308	2257	25083	8463	12238	11932	10136	9914	0	101
Wilderness Mgmt	448350	448350	637235	448350	637235	448350	448350	448350	637235	448350	448350	448350	448350	448350
Wilderness Study Mgmt	0	230723	41838	41838	41838	41838	41838	41838	41838	41838	41838	41838	41838	41838
Campground Mgmt	0	1733	1768	1768	1733	1733	1753	1768	1733	1738	1768	1734	1734	1734
Concentrated Recreation Mgmt	0	14193	6887	10029	13440	13440	11793	13055	11917	11904	9092	8694	6141	14930
Concentrated Recreation/Range Mgmt	0	675	2109	5634	1428	1428	3390	1813	2946	2959	3296	4069	0	1029
Concentrated Recreation/Timber Mgmt	0	0	4099	0	0	0	0	0	0	0	0	0	0	0
Concentrated Recreation/Timber/ Range Mgmt	0	0	1374	0	0	0	0	0	0	0	0	1400	4912	0

1/ A description of the FORPLAN prescription grouped into these management emphases is given in Appendix C.

TABLE S.2 RESOURCE PRODUCTION AND EFFECTS BY ALTERNATIVE

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)
RECREATION SETTING BY 2030 (Base Year 1980 in Parenthesis)	Thousand Acres											
-Primitive (Wilderness)	(448)	448	448	448	637	448	448	448	637	448	448	448
-Semi-Primitive	(889)	762	328	328	206	407	814	750	299	430	855	600
-Roaded Natural Appearing	(489)	616	861	050	983	971	564	628	890	523	523	778
-Rural	(17)	17	17	17	17	17	17	17	17	17	17	17
-Disturbance Campground Construction 1982-2030	Acres	0	36	36	0	0	18	36	6	6	36	36
VISUAL QUALITY OBJECTIVES												
-Preservation	Acres	448	637	448	637	448	448	448	637	448	452	448
-Retention	Acres	233	44	44	44	44	233	44	44	44	44	44
-Partial Retention	Acres	571	393	427	336	442	633	824	451	468	842	590
-Modification	Acres	591	770	924	826	909	529	527	711	883	505	761
WILDLIFE												
-Wildlife Habitat Improvement	Acre Equivalents											
1982-1990		2170	5490	5940	1980	2060	5840	2100	3320	3410	3245	3245
2021-2030		2170	5370	5880	1980	2040	5840	2040	3230	3270	3150	3150

TABLE S.2 RESOURCE PRODUCTION AND EFFECTS BY ALTERNATIVE

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)
WILDLIFE (continued)												
-Elk Population	Number											
1982-1990		8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	NA 1/
2021-2030		8500	8100	8000	8300	8200	9300	7860	8200	8100	8400	NA
-Wolf Population	Number											
1982-1990		6	6	6	6	6	6	6	6	6	6	6
2021-2030		6	6	6	6	6	6	6	6	6	6	6
-Grizzly Bear Population	Number											
1982-1990		100	100	100	100	100	100	100	100	100	100	100
2021-2030		100	100	100	100	100	100	100	100	100	100	100
-Catchable Fish	Number (Thousands											
1982-1990		202	202	202	202	202	202	202	202	202	202	NA
2021-2030		202	167	174	186	186	208	170	192	192	190	NA
-Big Game Forage	Thousand AUMs											
1982-1990		249	239	238	246	247	250	239	241	242	241	241
2021-2030		250	241	241	250	250	252	239	242	244	243	242
-Habitat for Old Growth Users	Acres											
1982-1990		512769	484612	482280	502696	498060	512341	512007	504529	502192	509294	506643
2021-2030		541124	489109	483906	515639	512162	563422	564064	503755	495741	542146	515114
-Habitat for Grass-Forb Users	Acres											
1982-1990		17035	26797	29016	21277	22881	17263	17926	21061	22321	18549	25524
2021-2030		31495	77292	82191	54380	57112	40135	39058	89156	96279	58363	66884
-Total Land Harvested in Undeveloped Areas by 2030	Acres											
Nonwinter range		25104	78961	113959	56508	66383	19502	20708	65801	86982	32994	53796
Winter range		4967	2586	1750	9602	10063	268	3641	1200	2085	4060	4568

1/ NOT AVAILABLE

TABLE S.2 RESOURCE PRODUCTION AND EFFECTS BY ALTERNATIVE

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)
WILDLIFE (continued)												
-Average Annual Prescribed Burning for Wildlife Habitat Improvement	Acres	175	770	813	226	211	655	215	500	463	370	370
-Elk Hunter Recreation	Thousand Hunter Days											
1982-1990		63.9	63.9	63.3	63.9	63.9	63.9	62.9	63.5	63.5	63.9	NA
2021-2030		63.9	50.4	51.6	56.3	55.3	71.9	56.9	55.0	53.0	60.1	NA
RANGE	Thousand AUMs											
1982-1990		72.3	73.0	73.0	73.0	73.0	71.8	73.0	72.8	72.8	72.8	72.8
2021-2030		72.3	86.4	87.5	81.4	81.5	71.4	89.9	84.4	84.7	79.2	79.2
-Ave. Annual Range Burning for Forage Production	Acres	1398	2284	2345	1564	1552	1324	2266	2165	2010	1839	1839
TIMBER												
-Programmed Sales Offered	Million Board Ft.											
1982-1990		13.0	20.0	20.0	14.0	14.0	12.5	12.5	14.0	14.0	14.0	15.5
2021-2030		13.0	41.0	41.0	23.7	23.7	12.5	12.5	33.1	34.0	24.0	26.6
-Acres Harvested	Acres											
1982-1990		1411	2094	2316	1531	1692	1433	1524	1520	1646	1581	2260
2021-2030		1228	3833	4134	3369	2850	1386	1172	3819	3998	2304	2042
-Long Term Sustained Yield	Million Board Ft.	14.3	41.1	43.5	32.6	33.6	18.3	16.0	34.6	38.8	25.4	26.4
-Growth of Long Term Sustained Yield at 2030	Percent	12	47	34	28	25	31	37	36	27	50	51
-Acres Available, Capable, Suitable	Acres	195533	473414	541678	452806	466071	209364	226762	433691	534186	286042	308872

TABLE S.2 RESOURCE PRODUCTION AND EFFECTS BY ALTERNATIVE

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)
TIMBER (continued)												
-Ave. Annual Silvicultural Burning for Composition and Stocking Control	Acres	0	94	110	115	204	0	0	100	150	70	84
-Ave. Annual Activity Fuel Treatment	Acres	1393	3143	3294	2367	2382	1497	1300	2503	2672	1697	2033
SOIL AND WATER												
-Sediment Yield	Tons											
1982-1990		2190	2620	4350	3190	3430	2190	3040	3160	3350	2190	2420
2021-2030		1840	5830	6210	5050	4280	1760	2066	5730	6000	2740	3040
-Water Quantity	Thousand Acre Feet											
1982-1990		1698	1698	1698	1698	1698	1698	1698	1698	1698	1698	1698
2021-2030		1700	1720	1720	1710	1710	1700	1700	1720	1720	1710	1710
MINERALS												
-Estimated Disturbance From Oil and Gas Occupancy	Acres	3830	3983	3753	3677	3715	3639	3907	4519	4481	4328	4328
-Land Available for Oil and Gas Occupancy Leasing	Thousand Acres	692	705	650	678	733	630	664	650	706	685	685
LANDS												
-Lands Required for Right-of-Way	Miles	99	199	199	183	183	168	148	169	169	70	76
ROADS												
-Arterial and Collector	Miles											
-1982-1990		1.5	2.1	2.4	1.5	1.6	0.9	5.2	1.5	2.2	4.5	5.2
-2021-2030		5.1	17.9	19.1	5.4	10.1	1.5	2.8	6.5	17.4	4.8	10.1
-Local	Miles											
-1982-1990		12.5	21.0	22.9	16.2	17.6	15.3	10.7	16.0	17.1	14.1	19.8
-2021-2030		10.7	33.8	36.1	29.3	24.8	12.0	10.2	33.2	34.8	14.6	17.7

TABLE S.2 RESOURCE PRODUCTION AND EFFECTS BY ALTERNATIVE

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)
FACILITIES												
-Disturbance from Roading	Acres											
Arterial and Collector												
1982-1990		10.5	14.7	16.8	10.5	11.2	6.3	36.4	10.2	23.1	31.5	36.4
2021-2030		35.7	125.3	133.7	37.8	70.7	10.5	26.6	45.5	121.8	33.6	70.7
Local												
1982-1990		62.5	105.0	114.5	81.0	88.0	76.5	53.5	80.0	85.5	70.5	99.0
2021-2030		53.5	169.0	180.0	146.5	124.0	60.0	51.0	166.0	174.0	73.0	88.5
PROTECTION												
-Insect & Disease Relative Effects	Index	.15	.26	.30	.24	.27	.14	.17	.24	.29	.20	.24
SOCIAL/ECONOMIC												
-Change in Employment	Person-Years											
1982-1990		0	186	186	24	23	-1	1	16	13	23	34
2021-2030		0	588	588	254	228	-6	17	422	403	260	196
-Change in Income	Thousand Dollars											
1982-1990		0	1438	1438	297	266	9	10	226	287	26	472
2021-2030		0	6968	6968	3297	3226	-42	43	5648	5495	3305	2672
-Change in Population	People											
1982-1990		0	427	427	55	53	2	3	37	33	50	55
2021-2030		0	1352	1352	584	524	-15	40	970	927	600	665
-Return to U.S. Government [2]	Million Dollars											
-1982-1990		.83	.99	.99	.86	.82	.83	.83	.83	.83	.83	.95
-2021-2030		1.07	2.27	2.27	1.53	1.53	1.05	1.08	1.92	1.95	1.54	1.83
-Present Value @ 4%		23.50	38.90	38.90	28.80	28.80	23.20	23.40	31.00	31.10	28.50	34.50
-Total Budget required to implement [2]	Million Dollars											
-1982-1990		3.87	4.65	4.82	4.10	4.17	4.20	4.06	4.04	4.16	4.31	4.94
-2021-2030		4.03	8.13	7.42	4.97	5.24	4.17	4.55	5.62	6.49	5.41	6.40

TABLE S.2 RESOURCE PRODUCTION AND EFFECTS BY ALTERNATIVE

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)
Present Value Benefits [2] @ 4%		374.81	651.23	694.24	544.41	544.43	387.38	400.16	559.79	587.62	522.69	533.56
-Excluding Present Value Returns to U.S. Govt.		351.31	612.33	655.34	515.61	515.63	364.18	376.76	528.52	556.52	494.19	519.06
Present Value Cost @ 4%		199.68	400.94	446.10	301.82	315.10	212.90	219.77	311.69	350.92	305.41	329.78
-Present Net Value [2]	Million Dollars											
- at 4%		175.3	250.6	248.1	242.6	229.2	173.2	179.1	248.2	236.0	217.4	223.8
- at 7-1/8%		75.0	183.6	103.1	100.5	94.2	77.5	73.9	100.7	96.2	92.1	92.9

[2] Values given in 1978 dollars

ALTERNATIVE SUMMARY

ALTERNATIVE SUMMARY

This part summarizes the comparison and evaluation of alternatives.

Current Plan

The Current Plan fails to take advantage of opportunities to increase timber and range outputs where conflicts are minimal with other resource values. Employment and income opportunity would not change. Timber harvest on undeveloped lands is emphasized. Recommendations on oil and gas leases would include standard and special stipulations to protect surface resources. Current Plan retains only some of the semi-primitive lands of high public interest. The quality of elk hunting and threatened and endangered species habitat would decrease slightly. The Current Plan did not rank very high in PNV nor did it adequately address the qualitative net public benefits.

The Current Plan, with no increase in range and timber outputs, would not significantly affect the physical and biological environment. Roading of undeveloped lands would forego semi-primitive recreation opportunities although this roading would benefit those people who enjoy motorized recreation.

Alternatives A

Alternative A has the highest level of timber and range outputs and comes closest to meeting RPA objectives. Employment and income increases would be the greatest under this alternative. It would harvest timber on lands which are low in productivity, high in development cost, and environmentally more sensitive. Alternative A would maximize the exploration and development of potential gas and oil reserves. The quality of elk hunting and threatened and endangered species habitat would be reduced the most under this alternative. Wildlife would be adversely impacted, especially big game. A loss in wildlife population would indirectly affect the social and economic environment by reducing the amount and quality of recreation associated with wildlife, especially the economic benefits associated with big game hunting. Even though wildlife habitat improvement would triple, most of this increase would be directed at mitigating the impacts of other programs. All the semi-primitive recreation areas of high public interest would be developed by 2030 except in Alternative A-1 where MWSA areas would be recommended for wilderness classification. Although Alternative A has the highest PNV, it ranks the lowest in terms of maximizing qualitative net public benefits.

Alternative A would cause the greatest change in the environment. Much of the undeveloped land would be roaded. The increased roading would benefit those people who enjoy motorized recreation. Foregone semi-primitive recreation opportunities would be a long term effect of this roading. An increase in timber and range production would have a beneficial effect on the surrounding communities by increasing income and employment in those communities.

Alternative B

Alternative B increases timber and range production moderately from the current level. Employment and income would increase. Alternative B would provide for a continuation of the current method by which oil and gas lease applications are processed. Most of the area of high public interest would be developed. The quality of elk hunting and threatened and endangered species habitat would decrease significantly. Alternative B ranks high in PNV, but is low in the evaluation of qualitative net public benefits.

Alternative B would have significant effects on the biological, social, and economic environments. Big game and other wildlife populations would decrease. Along with this wildlife decrease would be a loss in recreation and hunting opportunities and the economic benefits from big game hunting. These decreases are greater than the Current Plan but less than Alternative A. The moderate increases in commodity production would benefit local communities through increased employment and income. Many semi-primitive recreation opportunities would be foregone because of the roading of undeveloped lands. Increased roading would benefit those people who enjoy motorized recreation.

Alternative C

Alternative C, by maintaining timber harvest at slightly below current levels and decreasing domestic grazing, would fail to take advantage of opportunities to increase timber and range outputs where conflicts are minimal. This alternative showed slight decreases in employment and income. Oil and gas development would have more restrictions because semi-primitive recreation areas would be protected by non-surface occupancy stipulations. Nearly all areas of high public interest would be retained in a semi-primitive recreation setting with an emphasis on improving wildlife habitat. The quality of elk hunting and threatened and endangered species habitat would increase. Although this alternative had the lowest PNV, it would come closest to maximizing the qualitative net public benefits.

Alternative C would cause the least change in the physical and biological environment. The slight decrease in domestic livestock grazing would improve habitat for big game, especially on winter ranges. This decrease in grazing would have a small adverse impact on ranching communities. Other economic benefits to surrounding communities would not change significantly since commodities such as timber remain at the current level. Large areas would be retained for semi-primitive recreation which would benefit those people who enjoy this type of recreation.

Alternative D

Alternative D maintains timber harvest at slightly below current levels and increases grazing to its maximum level. This increase in grazing would increase employment and income slightly. Alternative D foregoes the opportunity to increase timber outputs where conflicts are minimal with other resources. Alternative D would provide less opportunity for oil and gas exploration and development because semi-primitive recreation areas would be protected by non-surface occupancy stipulations. Most semi-primitive recreation areas of high public interest would be retained. The quality of threatened and endangered species habitat would be maintained. The quality of elk hunting would be expected to decrease due to the increase in grazing on big game winter ranges having an adverse effect on elk population. Alternative D has a low PNV and also would decrease some of the qualitative net public benefits.

Alternative D would have significant impacts on some biological and economic environments. The large increase in domestic grazing would benefit those people and communities that depend on ranching by increasing job opportunities and income. However, big game populations would decrease because of domestic grazing increases on important winter range. The decrease in big game populations would have adverse social and economic effects by decreasing recreation opportunities associated with wildlife, especially the economic benefits associated with big game hunting.

Alternative E

Alternative E, with high timber and range outputs for the Jefferson Division, would come closest to meeting RPA objectives for the Jefferson Division of the Forest. Large increases in employment and income would be realized for that area. This alternative would also harvest timber on lands which are low in productivity, high in development environmentally more sensitive. On the Rocky Mountain Division, where no development would be planned, oil and gas exploration would be more restrictive. The quality of threatened and endangered species habitat would increase. However, the quality of elk hunting in the Jefferson Division would decrease considerably. All semi-primitive recreation areas of high public intent would be developed in the Jefferson Division, except in Alternative E-1 where the MWSA areas are recommended for wilderness classification. Although the PNV of this alternative ranked fairly high, the qualitative net public benefits would be very low in the Jefferson Division.

Effects on the Jefferson Division would be similar to Alternative A and similar to C on the Rocky Mountain Division.

Alternative F - Preferred Alternative

Alternative F provides for an increase in timber and range outputs in a cost effective manner while providing a wide range of dispersed recreation opportunities and maintaining important wildlife and fisheries habitat. There would be some increase in employment and income opportunities. Alternative F would provide for a continuation of the current way oil and gas lease applications are processed. This alternative best responds to the economic needs of the local people while fulfilling a greater share of regional and national needs. Almost all semi-primitive areas of high public interest would be retained. The quality of elk hunting decreases slightly, while the quality of habitat for threatened and endangered species is maintained at current levels. Although this alternative did not have the highest PNV, the interdisciplinary team felt this alternative came the closest to maximizing net public benefits.

Alternative F would have beneficial impacts on the surrounding communities by increasing employment and income through increased grazing and timber harvest. However, these increases are not as great as in Alternatives A, B, and E. Big game populations and other wildlife populations would decrease slightly when compared with the Current Plan. These decreases would have little effect on the recreational opportunities associated with wildlife and the economic benefit of big game hunting. Most of the semi-primitive recreation opportunities would be retained, which would benefit those people who enjoy that type of recreation.

DEIS
SECTION 1

CHAPTER 1
PURPOSE OF AND NEED FOR THE PROPOSED ACTION

Overview

This chapter describes the planning process and legislative framework for the Lewis and Clark Forest Plan covered by this DEIS (Draft Environmental Impact Statement). It also describes the general area covered by the plan and summarizes the public issues and Forest Service concerns addressed by the plan. The action, its impacts, the public issues, and Forest Service concerns determined the scope of the DEIS.

PLANNING PROCESS

FOREST PLAN

Proposed Action

The Lewis and Clark National Forest proposes to evaluate its present management plan, along with several other possible plans, and to select and implement the best plan. Public issues and Forest Service concerns identified early in the planning process revealed that the present management plan could be improved. This DEIS discloses the effects of the proposed action and alternatives.

Revisions and Amendments

The Forest Plan is designed to guide Forest management for the next 50 years. It will be revised at least every 10 years, and can be amended as needed. These provisions ensure that the Forest Plan will be dynamic and responsive to changing conditions.

Legislation

Preparation of the Forest Plan is required by RPA (Forest and Rangeland Renewable Resources Planning Act), as amended by the NFMA (National Forest Management Act). The preparation of an EIS (environmental impact statement) disclosing effects of a proposed action and alternatives to it is required by NEPA (National Environmental Policy Act), Council on Environmental Quality regulations (40 CFR 1500), and the implementing regulations of NFMA (36 CFR 219).

Interdisciplinary Planning

The planning process uses an interdisciplinary approach in developing the alternatives. This interdisciplinary approach was used throughout the planning process in analyzing the affected area, estimating the environmental effects, and writing the DEIS. The interdisciplinary team used during this process included specialists from the natural and social sciences and environmental design arts. Frequent interaction between team members ensured consideration of all resources and interests in the analysis and decisions documented in the DEIS. A complete listing of the make-up of the interdisciplinary team is contained in the planning record, "Lewis and Clark National Forest Work Plan," and in the List of Preparers, Chapter V, of this document.

PLANNING PROCESS

Planning Process

The planning process, outlined in implementing regulations of the National Forest Management Act, was followed to develop the proposed action. The planning actions, as specified in the regulations and used in the Forest Planning process, are:

1. Identification of issues, concerns, and opportunities
2. Development of planning criteria
3. Inventory of data and information collection
4. Analysis of the management situation
5. Formulation of alternatives
6. Estimated effects of alternatives
7. Evaluation of alternatives
8. Selection of the preferred alternative
9. Implementation
10. Monitoring and evaluation

Remaining Process

This DEIS has been prepared and circulated for comment after completion of planning actions 1 through 7. As part of planning action 7, a preferred alternative is shown in the DEIS and is the basis for the Proposed Lewis and Clark National Forest Plan. After the close of the comment period, planning actions 1 through 7 will be repeated to the extent necessary and a FEIS (Final Environmental Impact Statement) will be prepared, filed with the Environmental Protection Agency, and made available to the public. The Regional Forester will use the FEIS in making a decision under the National Forest Management Act on a plan of management for the Lewis and Clark National Forest. This decision will be documented in a Record of Decision which will be available to the public.

Planning Records

All of the documents and files (planning records) containing the results of the Forest planning process are available for inspection during regular business hours at the Lewis and Clark National Forest Supervisor's Office, 6th Floor, CASCO Building, Great Falls, Montana. Appendix A lists those planning records that are available on request. These planning records contain the detailed information and decisions used in developing the Forest Plan as required in NFMA regulations. The planning records are incorporated by reference at appropriate points in the text and appendixes of the DEIS and Forest Plan.

Terms and Concepts

Many of the words and concepts that appear throughout this DEIS and Forest Plan require precise definition. The Glossary in Appendix B contains commonly used terms.

LEGISLATIVE FRAMEWORK

FOREST SERVICE PLANNING

Forest planning works within the framework of National Forest Service planning. Based on the National Resource Planning Act Program, resource objectives are assigned to Forests. The questions of achieving objectives assigned the Lewis and Clark National Forest and local issues and concerns are addressed in this DEIS and Forest Plan.

Wilderness Study

The Forest contains three wilderness study areas: Middle Fork Judith, Big Snowies, and Deep Creek-Reservoir North. As part of the Forest planning process, the Regional Forester is making preliminary recommendations on the Middle Fork Judith Wilderness Study Area and the Big Snowies Wilderness Study Area. Wilderness studies on these lands are required by the MWSA (Montana Wilderness Study Act) of 1977 (Public Law 95-150).

Section 1 of this DEIS discloses the effects of managing the study areas under various alternatives on a Forest-wide basis in compliance with NFMA. Section 2 evaluates the study areas on an individual basis in compliance with the Wilderness Act and MWSA. The recommendation for detailed management of these areas is found in the Forest Plan.

Note: Any recommendations for the MWSA areas are preliminary administrative recommendations which will receive further review and possible modification in the offices of the Chief, the Secretary of Agriculture, and the President. Congress has reserved the right to make final decisions on wilderness designation.

The Regional Forester will not make a recommendation on the Deep Creek-Reservoir North Wilderness Study Area until oil and gas potential for that area has been determined.

The three wilderness study areas will be managed, subject to existing private rights and uses, to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System until Congress determines otherwise.

LEGISLATIVE FRAMEWORK

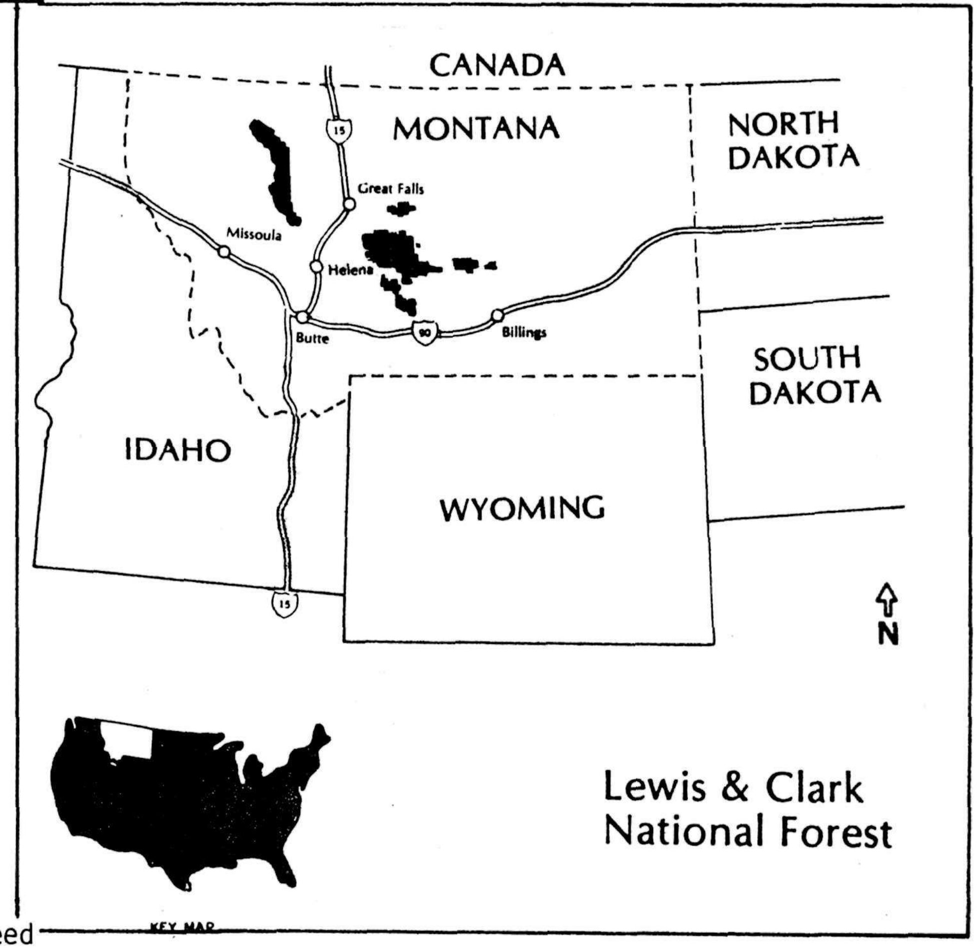
Previous Plans

The Forest Plan replaces all previous resource management plans prepared for the Forest. After approval of the Forest Plan, all permits, contracts, and other instruments for the use and occupancy of National Forest System lands must conform with the Forest Plan. In addition, all subsequent activities affecting the Forest, including budget proposals, will comply with the Forest Plan.

Future Management

Environmental analyses for project implementation will be tiered to this Forest Plan EIS. The Forest Plan is specific in its allocation of uses to the land in terms of actions, intensities, and location. The EIS would satisfy the requirements of NEPA for providing full and fair discussion of significant environmental impacts of the actions and projects listed in the Forest Plan such as timber sales, grazing allotments, land exchanges, rights-of-way acquisition, and oil and gas leasing, exploration, and development. Detailed project designs and layouts will result from more intensive on-site investigation. Differences in individual projects will be handled through further NEPA procedures.

LOCATION MAP

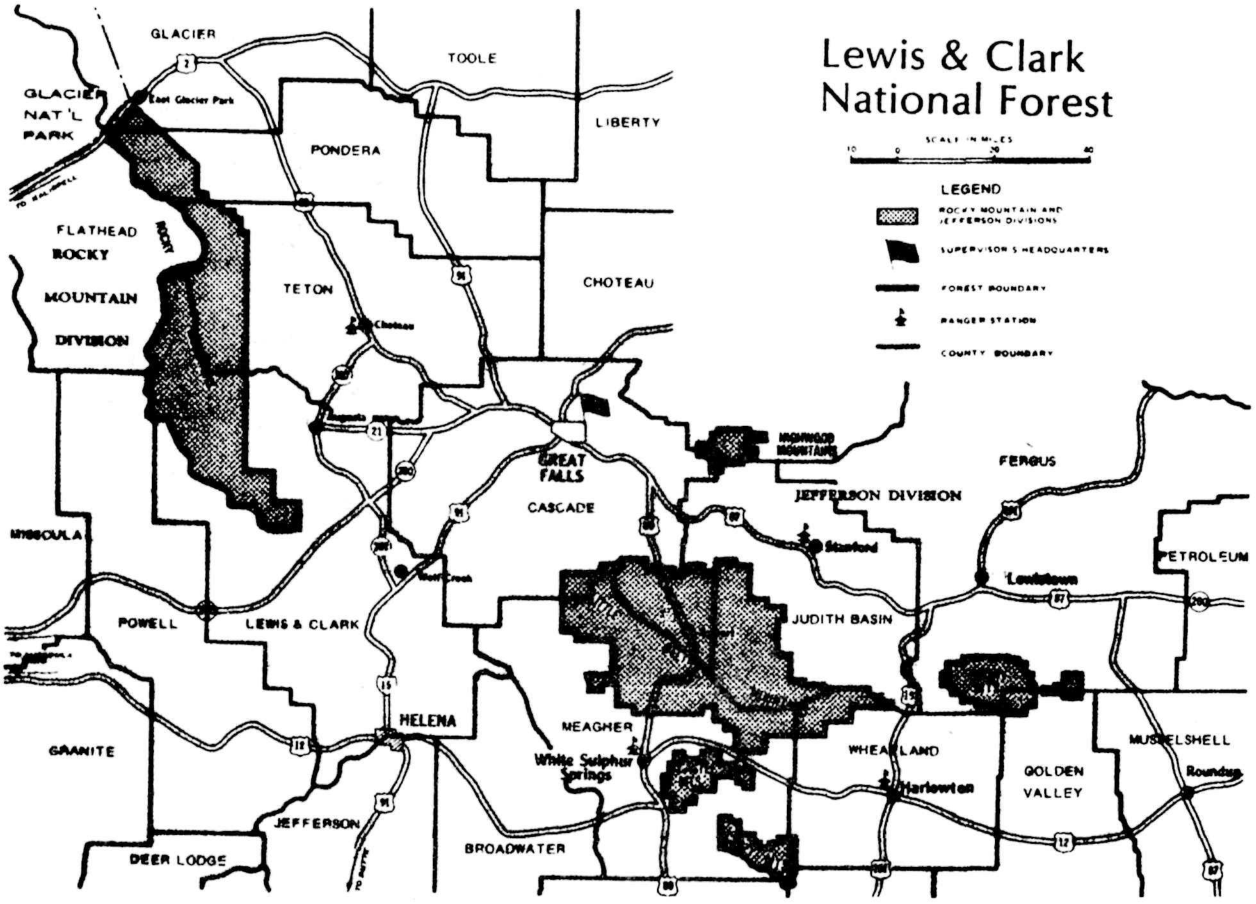

CANADA
MONTANA
NORTH DAKOTA
15
Great Falls
Missoula
Helena
Butte
90
Billings
SOUTH DAKOTA
IDAHO
WYOMING
15
N
Lewis & Clark National Forest
KEY MAP

GENERAL AREA

GENERAL DESCRIPTION

The Lewis and Clark National Forest is located in north-central Montana within the upper Missouri River system. Historically, the Forest has been referred to by two major divisions: the Rocky Mountain Division containing the Rocky Mountain Ranger District, and the Jefferson Division containing the Judith, Musselshell, and Kings Hill Ranger Districts.

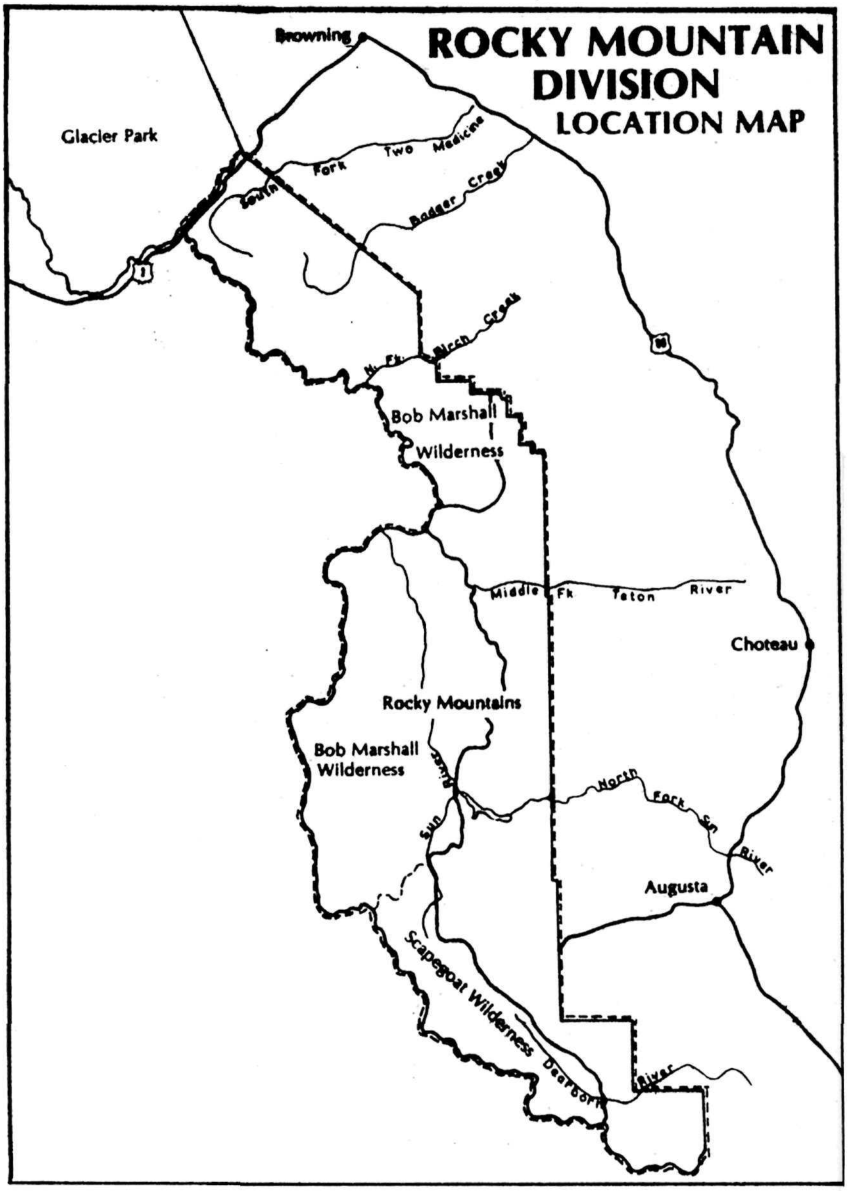
VICINITY MAP


Lewis & Clark
National Forest
SCALE IN MILES
10 0 20 40
LEGEND
ROCKY MOUNTAIN AND JEFFERSON DIVISIONS
SUPERVISOR'S HEADQUARTERS
FOREST BOUNDARY
RANGER STATION
COUNTY BOUNDARY
GLACIER
TOOLE
LIBERTY
GLACIER NAT'L PARK
East Glacier Park
PONDERA
FLATHEAD
ROCKY MOUNTAIN DIVISION
TETON
CHOTEAU
Choteau
Augusta
GREAT FALLS
HIGHWOOD MOUNTAINS
JEFFERSON DIVISION
FERGUS
CASCADE
Stanford
Lewistown
PETROLEUM
MISSOULA
Wolf Creek
POWELL
LEWIS & CLARK
JUDITH BASIN
HELENA
MEAGHER
White Sulphur Springs
WHEATLAND
Harlowton
GOLDEN VALLEY
MUSSELSHELL
Roundup
GRANITE
JEFFERSON
DEER LODGE
BROADWATER

GENERAL AREA

Rocky Mountain Division

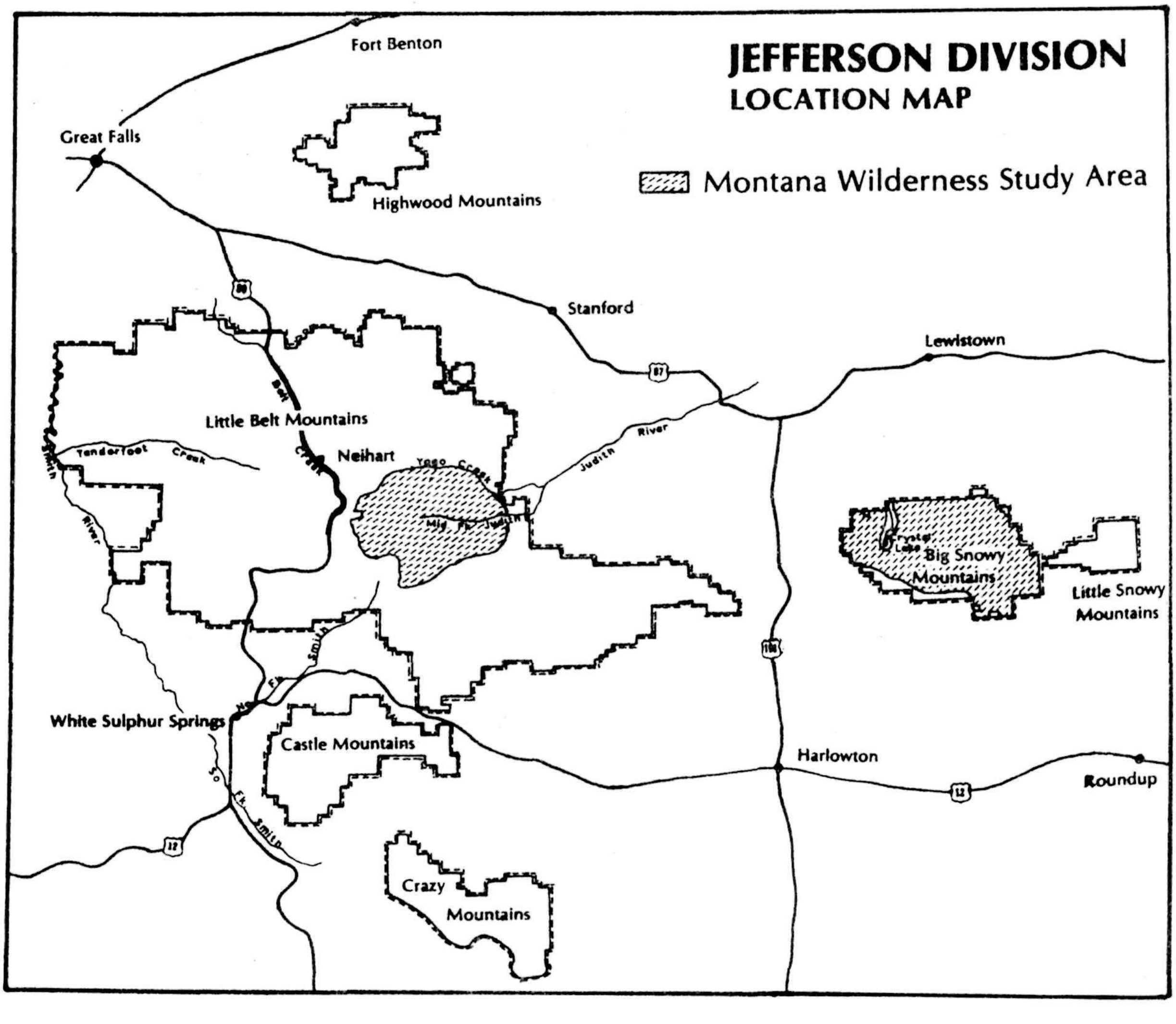
The Rocky Mountain Division, located in portions of Lewis and Clark, Teton, Pondera, and Glacier Counties, is bounded on the west by the Continental Divide and the Flathead National Forest, on the north by U.S. Highway 2 and Glacier National Park, on the south by the Helena National Forest, and on the east by the Blackfeet Indian Reservation and private lands.


ROCKY MOUNTAIN DIVISION LOCATION MAP
Browning
Glacier Park
South Fork Two Medicine
Badger Creek
2
89
N. Fk. Birch Creek
Bob Marshall Wilderness
Middle Fk Teton River
Choteau
Rocky Mountains
Bob Marshall Wilderness
Sun River
North Fork Sun River
Augusta
Scapegoat Wilderness
Dearborn River

GENERAL AREA

Jefferson Division

The Jefferson Division lies east and south of Great Falls and is surrounded by private or other Federal and State lands. The Jefferson Division, located in portions of Cascade, Chouteau, Judith Basin, Fergus, Golden Valley, Wheatland, Sweetgrass, Park, and Meagher Counties, has six distinct mountain ranges. The Crazy Mountains, lying southwest of Harlowton, are partly administered by the Lewis and Clark and partly by the Gallatin National Forest to the south. The other mountain ranges in this Division are: the Little Belt Mountains, southeast of Great Falls; Castle Mountains, east and south of White Sulphur Springs; Big Snowy and Little Snowy Mountains, south of Lewistown; and Highwood Mountains, east of Great Falls.


JEFFERSON DIVISION
LOCATION MAP
▨ Montana Wilderness Study Area
Fort Benton
Great Falls
Highwood Mountains
89
Stanford
Lewistown
87
Little Belt Mountains
Belt Creek
Neihart
Tenderfoot Creek
Smith River
Yogo Creek
Judith River
Middle Fk. Judith
Crystal Lake
Big Snowy Mountains
Little Snowy Mountains
191
N. Fk. Smith
White Sulphur Springs
Castle Mountains
Harlowton
12
Roundup
So. Fk. Smith
Crazy Mountains

ISSUES

ISSUE IDENTIFICATION

The Forest Plan addresses public issues and management concerns related to Forest management. These issues and concerns have been phrased as questions that the Forest will respond to in this DEIS.

Scoping Process

An initial list of Forest-wide public issues and management concerns was developed from comments solicited at public and Forest Service meetings. A detailed discussion of the scoping process can be found in the planning record, "Identification of Public Issues and Management Concerns." This scoping process yielded hundreds of individual issues and concerns which were summarized as 39 planning questions dealing with resource allocation and use. These planning questions, therefore, represent the major public issues and management concerns identified.

ISSUES

Following is a list of the public issues and management concerns. Their disposition is discussed in Chapter II.

Recreation

- What recreation activities and use levels should be permitted?

- How many campgrounds or camping sites should be provided (both road and trail oriented)?

- What facilities should be provided at developed campgrounds?

- Should existing summer home permits be continued?

- What opportunities for both summer and winter off-road vehicle use should be provided?

- How much control (enforcement, closures, education) of off-road vehicles should be implemented?

Cultural Resources

- How can the Forest carry out identification, protection, interpretation, and management of cultural resources?

ISSUES

Wilderness

- Should the Deep Creek-Reservoir North RARE II further planning area be recommended to Congress for inclusion in the National Wilderness Preservation System?

- Should the amount of wilderness use be controlled and how?

Wildlife and Fish

- How much fish and wildlife habitat should be improved and to what extent?

- How should conflicts be resolved between wildlife and management activities of: domestic livestock grazing; timber; oil and gas exploration and development; minerals; recreation; wilderness?

- How much oil and gas activity can be accepted and still meet the intent of the Endangered Species Act?

Range

- How much domestic livestock grazing should be provided?

- Can and should the range structural and non-structural improvement program be improved and how?

- What are the effects of the following on domestic grazing: Clean water act; Early hunting season; Wilderness management; Wildlife management; Timber management; Recreation management; and how can the impacts be resolved?

- How and where should range be provided for elk as well as cattle?

- How can control of noxious weed be improved and to what extent?

Timber

- How much timber should be harvested?

- How can timber sales be prepared to provide proper coordination with other resources?

- Should sales, including timber salvage, be planned on uneconomical areas?

- What degree of slash cleanup should be required after timber harvest?

- What clearcutting, if any, should be allowed and how could clearcutting be coordinated with other uses?

- How much and what kind of reforestation is appropriate?

ISSUES

	- Should permits be required for free-use firewood cutting and what controls should be established? Consider the need to provide goods and services efficiently.
Water	- What coordination is necessary between water and other resources to protect watershed values and water quality?
Minerals and Energy	- How much mineral exploration and development should be allowed? - How should conflicts between exploration for and development of mineral resources and surface resource values be resolved? - How can the Forest help achieve the national need for energy self-sufficiency through conservation of renewable and nonrenewable energy resources?
Soil	- What measures are necessary to prevent or reduce erosion from: road and trail maintenance; off-road vehicle use; timber sales; and oil and gas exploration and development?
Lands	- How do the rights accorded to the Blackfeet Indian Tribe in the agreement modified by Congress in 1896 affect management of National Forest land covered in that agreement? - What landownership adjustment would support resource management goals and where should the Forest place its priorities in an adjustment program? - What is adequate access to and within the National Forest?
Research Natural Areas	- How can the Forest identify candidate research natural areas containing specific grassland shrub, and forest habitat types and aquatic ecosystems to most regional targets?
Special Interest Sites	- What is the best way to provide special management protection to special interest sites?
Facilities	- Should additional trails be provided? - What roads should be maintained and to what extent?

ISSUES

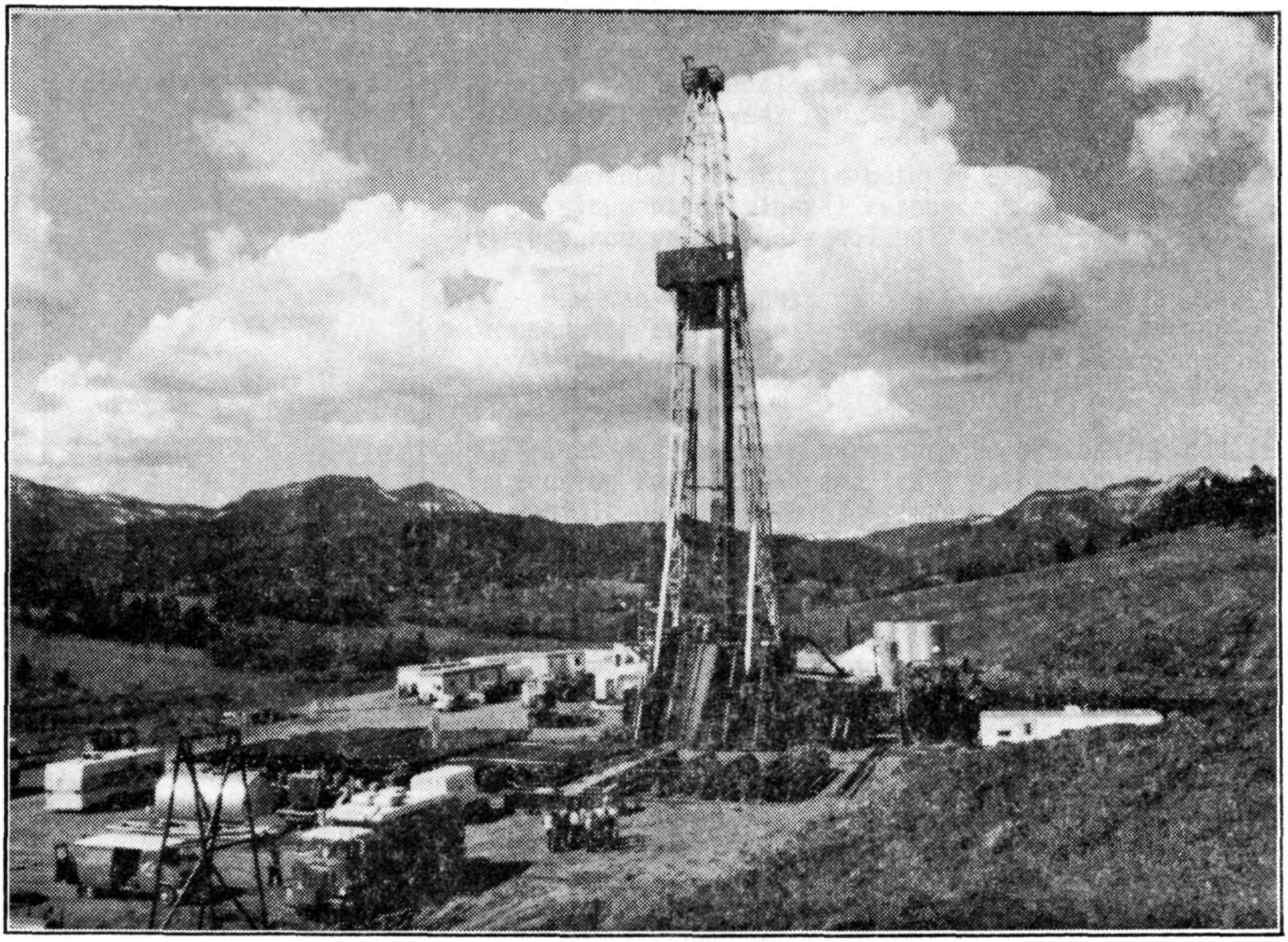
Protection

- How much, if any, prescribed burning should be planned?

- To what extent and in what manner should insect and disease control be carried out?

Economic Efficiency

- Consider the need to provide goods and services efficiently.



EXPLORATION OIL AND GAS DRILLING ADJACENT TO NATIONAL FOREST LANDS ON THE ROCKY MOUNTAIN DIVISION.

DEIS
SECTION 1

CHAPTER II
ALTERNATIVES CONSIDERED

Overview

This chapter describes the alternatives analyzed in the planning process. It is divided into five parts:

Alternative Formulation
Benchmarks
Needs For Change From Current Direction
Alternative Description
Alternative Comparison

Alternative Formulation describes the process used to formulate the alternatives. Benchmarks presents a narrative description of the benchmark levels developed in the analysis of the management situation. Change From Current Direction identifies the need and opportunity for change from the current management direction. Alternative Description presents a narrative description of each of the alternative management philosophies considered in detail. Descriptions of alternatives eliminated from detailed analysis are included in this part. Alternative Comparison displays the results and outputs of alternatives analyzed in detail and of benchmarks. These results and outputs are presented in graphic and narrative form.

ALTERNATIVE FORMULATION

ALTERNATIVE FORMULATION

Alternative formulation, planning action 5, resulted from a systematic set of interrelated actions beginning at the start of the planning process. In particular, planning actions 1 through 4, listed in Chapter I. The following discussion presents these actions in more detail.

Planning Action 1 — Identification of Issues, Concerns and Opportunities

Public issues and opportunities for management were identified through public involvement efforts, coordination with other Federal agencies, State agencies, local governments, and the Blackfeet Indian Tribe. Forest Service management concerns were added to the issues and opportunities. These issues and concerns are listed in Chapter I. Details on the process used to develop issues, concerns, and opportunities are available in the planning record, "Identification of Public Issues and Management Concerns."

Planning Action 2 — Development of Planning Criteria

Criteria were established to guide the planning process and to give management direction. Process criteria for the collection of inventory data, analysis of the management situation, and the formulation of alternatives were developed by the interdisciplinary team. Process criteria are documented in the planning record, "Proposed Criteria and Documentation."

Planning Action 3 — Inventory of Data and Information Collection

Using resource inventories of the Forest, a comprehensive data base was formed including landform, soils, wildlife, and vegetation information. Details on contents of the data base are contained in the planning record, "Data Base Components." Social and economic data for the counties directly affected by the Forest are available in the planning record, "Social Impact Assessment Baseline, 1980."

Planning Action 4 — Analysis of the Management Situation

The analysis of the management situation included identification of feasible ranges of goods, services, and uses; projected use levels; potential to resolve issues and concerns; the feasibility of providing the levels of goods, services, and uses resulting from assigned RPA objectives. This analysis identified the opportunity to or change management direction.

Planning Action 5 — Formulation of Alternatives

Alternatives list different ways to address and respond to the major public issues, management concerns, and resource opportunities. Alternatives result from planning actions 1 through 4 and are documented in the planning record, "Alternatives".

MAJOR COMPONENTS USED TO FORMULATE ALTERNATIVES

FOR PLAN Analysis Area

In the analysis of the management situation, a comprehensive resource allocation computer model called FORPLAN was used. FORPLAN uses a mathematical algorithm called linear programming to determine the most efficient mix of management prescriptions to achieve a desired goal. In using FORPLAN, analysis areas must be formed and management prescriptions assigned to them. Analysis areas represent homogenous areas of land formed from data stored in the data base, according to criteria from the interdisciplinary team. Analysis area information is contained in the planning record, "Analysis Areas." Further information on FORPLAN Model structure is in the planning record, "Lewis and Clark FORPLAN Model."

Management Prescriptions, Practices, and Standards and Guidelines

The NFMA regulations define management prescriptions as "management practices selected and scheduled for applications on a specific area to attain multiple use and other goals and objectives."

The interdisciplinary team reviewed the public issues and management concerns, used professional judgment, and consulted existing policy and legal requirements for guidance in developing multiple resource management prescriptions. This set of prescriptions portrays a broad range of management emphasis, intensities, management practices, standards and guidelines. The management standards and guidelines needed to accomplish the goals of a prescription include the necessary mitigation and resource coordination measures that are required by existing laws, regulations, and policies.

To fully explore appropriate, practical ways of managing the Forest for a variety of uses, the interdisciplinary team developed a set of rules (that included economic and cost effectiveness considerations) to guide the assignment of management prescriptions to various parts of the Forest (analysis areas). Within the rules and limitations of the model, the team considered all management prescriptions appropriate for each of the analysis areas on the Forest. The team based the assignment of management prescriptions on the land's inherent capability for resource production.

From this basic set of management prescriptions applied to the land, the Forest team developed yield and cost tables for use in modeling each prescription in the linear program (FORPLAN).

These prescriptions were used for the development of both benchmarks and alternatives after some initial screening analysis to determine cost effectiveness.

All management prescriptions included for analysis and the rules for assigning them to analysis areas are listed in the planning record, "Management Prescriptions." Management prescriptions are summarized in Appendix C. All management practices are listed in the planning record, "Management Practices."

Forest Management Guidelines are documented in the planning record, "Management Guideline Analysis Report," and summarized in Chapter IV of the Forest Plan.

Yield coefficients were developed for timber, recreation, range, wildlife, water, sediment, oil and gas, local roads, and insect and disease. Assumptions and methods of developing yield coefficients are available in the planning record, "Yield Coefficients."

Alternatives

An alternative is a combination of uniquely assigned management prescriptions that result in certain management direction, outputs, and effects. Different management prescriptions may be assigned to different areas. By varying the amount of acres assigned to management prescriptions, different alternatives can be developed.

FORPLAN was used to determine the optimal mix of management prescriptions and acres that would meet the objectives of each alternative in a cost-efficient manner. Constraints were applied to the various resources to explore the tradeoffs of each alternative. These constraints varied the amount of timber, semi-primitive recreation, forage for domestic livestock and wildlife, and cost. Also spacial distribution was used to constrain the allocation to emphasize visual concerns and areas of high interest for semi-primitive recreation in some alternatives. Maps of the alternatives were prepared and reviewed by the interdisciplinary team. Constraints applied to alternatives were revised if the interdisciplinary team felt the land uses could not be implemented. These alternatives were then rerun through FORPLAN to determine the optimal mix of prescriptions and acres within the new constraints. Constraints for each of the alternatives are described in Appendix D.

HOW ECONOMICS WAS USED IN THE DEVELOPMENT OF ALTERNATIVES

Present Net Value

The goals of the alternatives were quantified to form different output levels for each alternative. Each alternative had as its FORPLAN objective function the maximization of PNV (present net value). PNV is the discounted benefits less discounted costs associated with providing all resource outputs to which monetary value can be assigned, including both market and selected non-market outputs. The optimal mix of prescriptions was chosen by FORPLAN that would meet these objectives in a cost-efficient manner. The use of PNV as the objective function ensured compliance with NFMA regulations which require that:

> "Each alternative will represent to the extent practicable the most cost-efficient combination of management practices examined that can meet the objectives established in the alternative."

The following section discusses how the Lewis and Clark National Forest satisfied this requirement.

Dollar costs and benefits were developed for each of the management prescriptions. All dollar costs and benefits were adjusted, when necessary, to reflect constant 1978 dollars.

Costs

The FORPLAN model included costs for most Forest management activities. Costs for the management prescriptions were determined in a three step process. First, costs were gathered for the various Forest management activities by MIH (Management Information Handbook) codes. These MIH activities had been grouped together to define management practices. The second step was to add the cost of the MIH activities that formed each management practice. Practices were defined for timber, range, wildlife, minerals, recreation, wilderness, soil and water, roads and trails, and protection. The third step was to add all the costs of the practices that were contained in a management prescription.

General administration, fire protection, campground construction, and arterial and collector road costs were not included in the FORPLAN model, but were used in the PNV calculation. Logging costs were the only costs assumed to increase in real terms during the first five decades.

Benefits

Dollar values were assigned to benefits from timber, range, recreation, and oil and gas leasing. Recreation benefits were not included in the model, but were included in the PNV calculation. The benefits assigned to each resource are as follows:

-- Timber values represent the value delivered at the mill. The value of timber at the mill, rather than average stumpage value, was used because site specific costs were estimated for all costs of timber management and harvest, including both Forest Service and private operator costs. Timber values range from $91.81 per thousand board feet ($352.70 per thousand cubic feet) to $440.80 per thousand board feet ($1,732.39 per thousand cubic feet) depending on the species and diameter class.

Timber values were assumed to increase in real terms during the first 5 decades. For the remaining periods, these values remained constant.

-- Range values were obtained from studies done by Economic and Statistics Services, USDA. For this Forest, the value is $11.69 per AUM (animal unit month).

-- Recreation values were obtained from RPA estimates of these values. Values for dispersed and developed recreation, wilderness recreation, and hunter recreation are $3.00, $8.00, and $21.00 per RVD (recreation visitor day), respectively. Recreation values are assumed to increase in real terms during the first 5 decades and thereafter remain constant.

-- Oil and gas values for leased values are $1.00 per acre per year. (This was increased by the Bureau of Land Management to $2.00 per acre per year in late 1981 but was kept at $1.00 per acre for comparative purposes.)

For further information on costs, benefits, and projected real cost and value indices, see the planning record, "Economic Data and Analysis."

Importance of PNV

PNV for each acre was determined for each management prescription and timing choice using FORPLAN. FORPLAN was then used to evaluate alternatives through selection of prescriptions based on an objective function which maximizes PNV over a 150-year planning horizon.

A 4 percent real discount rate was used to calculate PNV. The 4 percent real rate approximately equals the return on private investments over and above the rate of inflation. In addition, a 7-1/8 percent discount rate was used to determine the sensitivity of alternatives to the discount rate.

PNV is influenced by the output levels, or objectives, that vary with each alternative. These objectives require the application of a unique set of constraints to the FORPLAN model with a common objective function of maximizing PNV. These constraints lead to a unique set of consequences defined in terms of PNV, resource outputs, and quantitatively and nonquantitatively measured effects, including the degrees of responsiveness to issues. The variations in consequences form the basis for the evaluation and comparison of alternatives.

HOW NET PUBLIC BENEFITS WERE USED IN THE DEVELOPMENT OF ALTERNATIVES

The interdisciplinary team considered net public benefits during alternative formulation. The interdisciplinary team considered both quantifiable and qualitative components of net public benefits and the tradeoffs that occur. Tradeoffs are expressed in terms of PNV and/or qualitative values forgone. For example, reducing PNV (due to constraints on the spacial distribution of timber harvest on the Rocky Mountain Front) for threatened and endangered species habitat may have a higher net public benefit than not giving up the PNV and foregoing habitat for those species. Alternatives were constructed to examine these tradeoffs and to enable decision makers to select a preferred alternative that maximizes net public benefit.

The specific PNV component of net public benefit is discussed in the previous section. The qualitative net public benefit components used in the alternative formulation process are briefly presented below:

Elk hunting quality
Semi-primitive recreation setting values
Threatened and endangered species habitat

These qualitative components are further explained in the alternative comparison section along with several components identified after the alternatives were formulated.

RPA Recommended Program

The National RPA (Resource Planning Act) assessment is prepared every 10 years. It includes an analysis of demand and the supply of resources from forest and rangelands available to meet this demand. The National RPA program, developed every 5 years, assigns goals and objectives to each Forest Service Region. Goals and objectives from the 1980 RPA program have been distributed from the Region to individual National Forests. Table 2.1 displays the RPA Recommended Program assigned to the Lewis and Clark National Forest. The comparison prepared for each alternative displays how it responds to these RPA goals and objectives.

TABLE 2.1 Projected National Forest System Program Outputs, Activities, and Costs. RPA Recommended Program

PROGRAM ELEMENT AND ACTIVITY	UNIT OF MEASURE	BASE YR. 1980	1982	1985	1986 -1990	1991 -2000	2001 -2010	2011 -2020	2021 -2030
RECREATION									
Developed Recreation Use	RECREATION VISITOR DAYS	NOT AVAILABLE	273850	296480	335940	361990	372820	409850	454650
Dispersed Recreation Use (Includes Wildlife & Fish)	RECREATION VISITOR DAYS	NOT AVAILABLE	623000	623000	640000	663000	692000	711000	724000
WILDLIFE									
Wildlife & Fish									
Wildlife Habitat Improvement /4/	ACRE EQUIVALENT	4225	3150	3520	6000	7900	7210	5780	5810
RANGE									
Grazing Use (Livestock)	ANIMAL UNIT MONTHS	79600	72410	72800	73000	76000	83000	88000	90000
TIMBER									
Programmed Sales Offered	MILLION BOARD FEET	13	10	16	21	30	34	37	41
Reforestation /5/	ACRES	337	1020	1500	870	950	1150	1370	1630
WATER									
Meeting Water Quality Goals	THOUSAND ACRE-FEET	1600	1617	1722	1712	1688	1707	1706	1706
MINERALS									
Mineral Leases and Permits	CASES	173	170	270	280	280	330	370	380
HUMAN AND COMMUNITY DVLPMT									
Human Resource Prgm /1/	ENROLLEE	1	41	44	5	4	5	5	5
SOILS									
Soil & Water Resource Imprvmt (Imp. Watershed Condition)	ACRES	134	120	120	110	110	100	110	120
COSTS									
Total Appropriated /2/3/	THOUSAND DOLLARS	3467	4800	6700	8300	7600	8300	8300	8400

/1/ Human Resource Programs whose funds are allocated to the Forest Service are not included in figures beyond 1985.
/2/ All costs and returns are shown in constant 1978 dollars.
/3/ NFS appropriated funds include all YCC and cooperator funds.
/4/ Forests have also been assigned population targets so they can assess our ability to meet a share of each State's.
/5/ Reforestation acre objectives include backlog areas.

BENCHMARKS

During the Analysis of the Management Situation, resource supply potentials were determined, using various objectives, constraints, and assumptions in FORPLAN. Single resource minimum and maximum supply potentials were established for timber, range, wildlife, and recreation. In addition, production capabilities were determined for a set of multiple resource outputs that maximize present net value. This analysis established the "benchmark" levels required by national planning direction. Three types of benchmarks were developed for the Lewis and Clark National Forest. They are:

> Minimum level benchmark - displays the minimum outputs associated with custodial management of the Forest and the unavoidable costs and benefits of public ownership.
>
> Maximum present net value benchmark - maximizes present net value for the Forest and displays the associated resource outputs.
>
> Resource benchmarks - defines the maximum potentials for each resource. They include maximization of timber, range, elk, and recreation.

Selected benchmarks were used to define the upper and lower limits for the production of each resource. The interdisciplinary team considered demand, supply potential (upper and lower limits), and economic characteristics to establish the range of alternatives. Opportunity costs were determined by comparing alternatives with the maximum PNV benchmark.

All benchmarks comply with the minimum requirements of applicable laws and regulations including prevention of significant or permanent impairment of the productivity of the land.

Following are descriptions of the benchmarks developed and considered in the Forest planning process. Table 2.2 summarizes the outputs from the benchmarks. A further description of the model formulation of benchmarks is included in the planning record, "Lewis and Clark FORPLAN Model." Benchmarks and alternative constraints and assumptions are summarized in Appendix D.

TABLE 2.2

AVERAGE ANNUAL TOTAL RESOURCE PRODUCTION BY BENCHMARK LEVEL

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	MIN LEVEL	MAX TIM	MAX RNG	MAX PNV	MAX ELK	MAX REC
Recreation Use Potential by 2030	Thousand RVDs						
-Rural		194	194	194	194	194	194
-Roaded Natural Appearing		1905	2435	2478	2521	1905	2521
-Semi-Primitive		218	168	166	164	218	164
-Primitive		52	52	52	52	52	52
-Developed		0	198	198	198	198	230
-Elk Population Potential	Animals						
-1982-1990		8500	NA 1/	NA	8500	8500	NA
-1991-2000		8800			8700	9500	
-2001-2010		9200			9000	10500	
-2011-2020		9600			8800	11500	
-2021-2030		10000			8600	12500	
Range	Thousand AUMs						
-1982-1990		0	29.4	90.0	26.7	26.7	26.7
-1991-2000		0	31.0	90.0	27.2	27.2	27.2
-2001-2010		0	31.6	90.0	27.0	27.0	27.0
-2011-2020		0	33.0	90.0	29.2	29.2	29.2
-2021-2030		0	33.7	90.0	33.5	33.5	33.5
Timber							
-Lands Available, Capable, Suitable	Thousand Acres	0	651	636	622	207	622
-Programmed Sales Offered	Million Board Feet (Million Cubic Feet)						
-1982-1990		0	24.0(7.1)	24.0(7.1)	24.0(7.1)	12.5(3.7)	24.0(7.1)
-1991-2000		0	31.2(9.2)	31.2(9.2)	31.2(9.2)	12.5(3.7)	31.2(9.2)
-2001-2010		0	40.5(11.9)	40.5(11.9)	40.5(11.9)	12.5(3.7)	40.5(11.9)
-2011-2020		0	52.7(15.5)	52.7(15.5)	52.7(15.5)	12.5(3.7)	52.7(15.5)
-2021-2030		0	68.3(20.1)	68.3(20.1)	68.3(20.1)	12.5(3.7)	68.3(20.1)
-Long Term Sustained Yield	Million Board Feet (Million Cubic Feet)	0	68.8(20.2)	56.3(16.6)	43.8(12.9)	18.1(5.3)	43.8(12.9)
-Budget Required to Implement	Million Dollars						
-1982-1990		2.71	4.70	4.94	4.49	4.13	4.19
-1991-2000		2.64	5.14	5.40	5.00	3.93	5.83
-2001-2010		2.64	6.55	6.88	6.07	3.80	7.21
-2011-2020		2.64	7.26	7.62	7.11	4.03	8.34
-2021-2030		2.64	9.60	10.08	8.62	4.00	9.35

1/ Not Available

BENCHMARKS

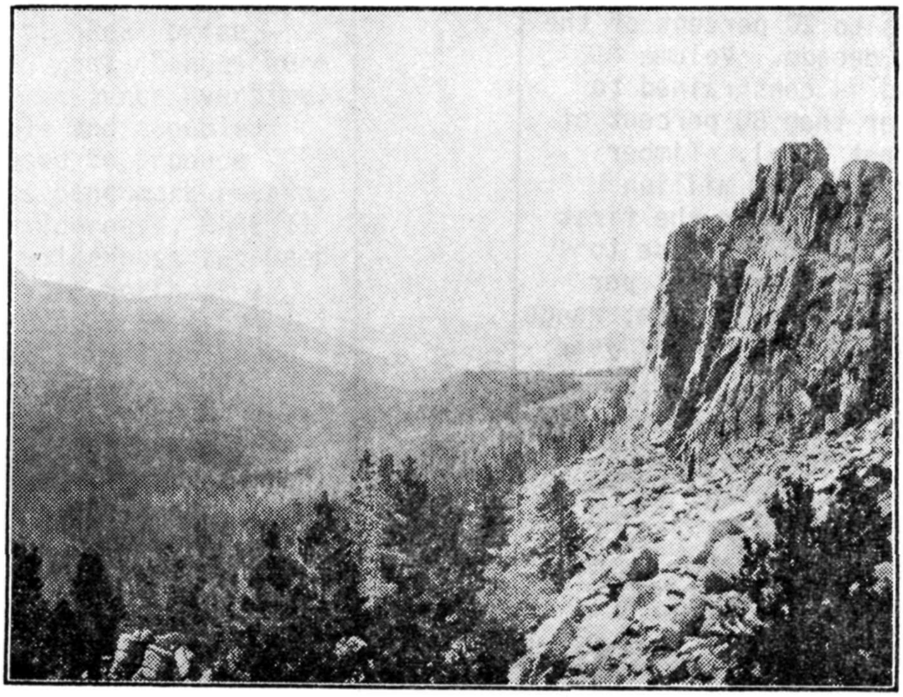
Minimum Level Benchmark

Description

This benchmark maximizes PNV with locked in minimum level prescriptions, displays the minimum outputs associated with custodial management of the Forest and the unavoidable costs and benefits of public ownership. No timber is harvested and range outputs decline from 72,000 AUMS (Animal Unit Months) per year to zero in the following decades. Wilderness management is continued at reduced service levels. Environmental constraints are limited only to those needed to prevent impairment of land productivity, assuming no management induced outputs, and within existing laws and regulations.

Purpose and Disposition

The purpose is to estimate naturally occurring outputs and costs of maintaining the Forest as part of the National Forest System, so that the controllable outputs and unavoidable costs can be identified. This benchmark is not a viable alternative because it is not responsive to public issues and management concerns, does not provide multiple resource uses and outputs, and is outside the jurisdictional authority of the agency as defined in the Organic Act of 1897, Multiple Use Sustained Yield Act of 1964, and the Resource Planning Act of 1974 as amended by the National Forest Management Act of 1976.



LOOKING DOWN WHITE SULPHUR CREEK
IN THE CASTLE MOUNTAINS.

Maximum Present Net Value Benchmark

Description

This benchmark maximizes present net value of all resources with market or assigned values (timber, range, recreation, and oil and gas leasing). Ending inventory constraints were used to maintain T&E species habitat, viable wildlife populations, and protect soil and water resources. While the ending inventory constraint was used, the non-declining sustained yield constraint was not used. Horizontal demand is assumed. Timber harvest levels are therefore constrained by mill capacity the first decade; thereafter increases in timber harvesting are limited to 30 percent and decreases to 20 percent of the previous decade. Volume harvested is constrained to be greater than 80 percent of the current level. Timber increases to 24.0 million board feet per year the first decade and then increase to 67.2 million board feet per year by the fifth decade; range averages 30,100 AUMs per year for all decades.

Purpose and Disposition

This benchmark meets minimum requirements of laws and regulations while providing the point from which opportunity costs of alternatives are determined. It provides the basis for comparing physical, biological, social, and economic tradeoffs of other more constrained alternatives. This benchmark was not studied in detail because of the high cost of implementation, the difficulty that existing markets would have absorbing such high timber volumes, and potential for disruptive change in community stability.

Maximum Timber Benchmark

Description

The maximum timber benchmark was analyzed with maximum present net value as an objective function. After an initial run to determine the maximum timber outputs for each decade, the benchmark was rerun with these outputs as constraints. The second run determined how the Forest could achieve these outputs in the most cost-efficient manner. Inventory and scheduled output constraints were used to maintain wildlife populations and to protect soil and water resources. Harvest flow constraints were the same as the maximum PNV benchmark. Ending inventory constraints were used to ensure the long term timber production capacity of the Forest. Real price increases and cost changes were used for all resource overtime. Only available and capable lands were used to produce timber. This benchmark retains classified wilderness, RARE II recommended wilderness and Deep Creek/ Reservoir North as a further planning area. An additional 21.9 million board feet per year is available within these areas. MWSA areas are considered available for timber harvest. Timber increases 24.0 million board feet per year the first decade and then to 68.5 million board feet per year by the fifth decade. Range decreases to an average of 31,200 AUMs per year.

Purpose and Disposition

The benchmark meets minimum requirements of laws and regulations concerning wilderness, T&E species, viable wildlife populations, improving habitat for selected species, and maintaining water quality while providing the maximum amount of timber that could be produced on the Forest in the most cost efficient manner. The maximum timber benchmark, by providing the upper limit of timber production, helped the management team establish different ranges of timber production for the alternatives studied in detail. Management for the maximum timber benchmark would violate the management standards and guidelines in the NFMA regulations. Water quality, wildlife habitat effectiveness and diversity, aesthetic values, and semi-primitive dispersed recreation opportunities would be adversely affected. Maximizing single resources, such as timber, is not in accordance with the NFMA requirements that the Forest Plan provide for the multiple-use sustained yield of all products and services.

Maximum Range Benchmark

Description

This benchmark maximizes forage production for domestic livestock. Ending inventory constraints were used. Timber harvest constraints used were the same as in the maximum timber benchmark except no timber harvest floor (bottom level) was used. A minimum floor constraint on range production was set at 80 percent of current level. Productive timberlands were retained for timber production, but scheduling of harvest was done to provide optimum forage production. Under maximum forage production, grazing would increase from the present level of 72,282 AUMs to a high of 122,000 AUMs in the 1st decade and decrease to 113,000 AUMs by 2030. The maximum production levels reflects: (1) the highest consumptive use by domestic livestock that can be achieved on the ground without mechanical damage and/or vegetative damage, and (2) forage production which must be left for non-consumptive allocations. This level does not account for area location and the practicality of domestic livestock using some areas. Some areas cannot be reached by domestic livestock or are so small and scattered they are unpractical to graze. In other areas, the lack of opportunity to develop any water source prevents domestic livestock grazing. A 90,000 AUM level is more likely closer to the maximum production potential that could be used. Timber increases to 68.3 million board feet per year by the fifth decade.

Purpose and Disposition

The maximum range benchmark, by providing the upper limit of range production, helped the management team establish different levels of forage production for domestic livestock for the alternatives studied in detail. This benchmark meets minimum requirements of laws and regulations but was not considered a viable alternative for the same reasons as the maximum timber benchmark.

Maximum Elk Benchmark

Description

This benchmark maximizes the elk population potential of the Forest. Non-declining sustained yield and ending inventory constraints were used. A minimum floor constraint on elk population was set at 80 percent of the current level. No timber harvest was used. No scheduling of timber harvest was done on winter rangelands in order to ensure adequate thermal cover. Timber harvest on nonwinter rangelands was constrained to 12.5 million board feet per year. This level of harvest would retain necessary hiding cover yet also create new forage for elk. Grazing on winter range is eliminated. The elk population potential would increase from 8,500 animals to 12,500 animals by 2030.

Purpose and Disposition

The maximum elk benchmark helped the management team establish the maximum elk population potential of the Forest. It was useful in evaluating each alternative studied in detail. This benchmark was not considered a viable alternative because of the severe reduction in domestic grazing.

BENCHMARKS

Maximum Recreation Benchmark

Description

This benchmark maximizes the number of RVDs that can be produced on the Forest in either a dispersed or developed recreation setting. This benchmark maximizes only recreation opportunity. Timber harvest constraints were the same as used in the maximum timber benchmark, except no harvest floor was used. RVDs (Recreation Visitors Days) in a dispersed setting increase from 2,393,000 RVDs currently to 2,931,000 RVDs by 2030. RVDs in a developed setting increase from 198,000 RVDs currently to 230,000 RVDs. Most semi-primitive settings are changed to a roaded natural appearing setting through timber harvesting. All potential developed recreation sites are developed.

Purpose and Disposition

The maximum recreation benchmark helped the interdisciplinary team establish the maximum recreation opportunity that can occur on the Forest in dispersed and developed recreation settings. This benchmark was useful in determining how much developed recreation the Forest could provide in each alternative. It meets minimum requirements of laws and regulations but was not considered a viable alternative for the same reasons as the maximum timber benchmark.

NEED FOR CONSIDERING CHANGE FROM CURRENT DIRECTION

NEED AND OPPORTUNITY FOR CONSIDERING CHANGE FROM CURRENT DIRECTION

The need for considering change from current direction was identified by the public issues and management concerns. The Analysis of the Management Situation identified opportunities to change individual resources. Benchmarks as part of the Analysis of the Management Situation established upper and lower potential production levels while meeting legal requirements. Additional analysis was done to estimate projected use levels for each resource - a proxy for demand. The following resource areas were examined for possible changes from current direction. Upper and lower physical production limits and projected use levels are displayed.

Developed Recreation

The public issues on which recreation activities and what use levels should be provided indicated that a change from current direction should be examined.

Current available developed recreation opportunity is 198,500 RVDs (Recreation Visitor Days) on 31 sites occupying 195 acres.

Under the current management direction, developed recreation in the public sector would stay at the current level; no additional facilities are scheduled to be built. The private sector would be encouraged to expand their role in providing developed recreation.

The maximum available developed recreation opportunity would increase from 198,500 RVDs in 1981 to 230,000 RVDs in 2030. It would be attained by expanding one existing site and developing 7 new recreation sites on 36 acres based on the existing inventory. Additional developed recreation sites may be available, but to identify them the Forest would have to be reinventoried. The Forest's ability to reach the maximum available developed recreation opportunity is limited by demand for additional developed recreation and its cost. The length of the managed season was not increased, but held at the present season.

The current developed recreation use in 1980 was 159,000 RVDs. This is projected to increase to 264,600 in 2030. Use will increase directly proportional to population growth. No adjustments were made to meet possible changing developed recreation needs, such as an increase in winter camping.

NEED FOR CONSIDERING CHANGE FROM CURRENT DIRECTION

The projected use will exceed the Forest ability to provide developed recreation under the current management direction in about 2000. Season of use can be expanded to meet some of this use.

DEVELOPED RECREATION

(Average Annual RVD's)

TIME PERIOD	1982-1990	1991-2000	2001-2010	2011-2020	2021-2030
Current Management	198,500	198,500	198,500	198,500	198,500
Maximum Opportunity	230,000	230,000	230,000	230,000	230,000
Projected Use Level	159,700	168,900	189,000	211,300	264,600

Dispersed Recreation

Current available dispersed recreation opportunity is 2,353,000 RVDs on the Forest. This includes 52,000 RVDs in a primitive recreation setting, 202,000 RVDs in a semi-primitive recreation setting, 1,905,000 RVDs in a roaded natural appearing recreation setting, and 194,000 RVDs in a rural recreation setting. Recreation opportunity is the projected capacity of an area to provide dispersed recreation based on the area's recreation setting.

Under the current management direction, the available dispersed recreation opportunity would increase from 2,353,000 RVDs in 1981 to 2,558,000 RVDs in 2030.

The maximum dispersed recreation opportunity available would increase from 2,353,000 RVDs in 1980 to 2,931,000 RVDs in 2030. It is attained by accessing undeveloped lands. This causes a change in the recreation setting from semi-primitive to roaded natural appearing or rural. These settings provide more dispersed recreation opportunity.

The current use in 1980 was estimated to be 622,200 RVDs. This is projected to increase to 1,477,000 by 2030. Use will increase in direct proportion to population growth. The projected use will be far below the available dispersed recreation opportunity. However, conflicts may exist between different recreational users.

DISPERSED RECREATION

(Average Annual RVD's)

TIME PERIOD	1982-1990	1991-2000	2001-2010	2011-2020	2021-2030
Current Management	2,393,000	2,433,000	2,475,000	2,516,000	2,558,000
Maximum Opportunity	2,487,000	2,550,000	2,638,000	2,811,000	2,931,000
Projected Use Level	622,200	700,000	894,000	1,283,000	1,477,000

Wilderness

The Forest currently administers parts of two units of the National Wilderness Preservation System; the Bob Marshall and the Scapegoat. These areas total 385,046 acres. Through the RARE II process, an additional 63,304 acres (Renshaw and Silver King-Falls Creek) have been recommended for wilderness classification. Another 41,838 acres (Deep Creek-Reservoir North) were allocated for further planning. Public Law 95-150; MWSA (Montana Wilderness Study Act) directs that 188,885 acres in the Big Snowy Mountains and the Middle Fork of the Judith be studied for possible inclusion into the wilderness system.

The maximum area of the Forest which could be classified as wilderness is 680,073 acres. This includes 385,046 acres of existing wilderness, 63,304 acres recommended for wilderness, 189,885 acres in MWSA areas, and 41,838 which will be studied in the future.

WILDERNESS OPPORTUNITY

Classified Wilderness	385,046 Acres
Recommended Wilderness	63,304 Acres
Further Planning	41,838 Acres
MWSA Areas	189,885 Acres
Total	**680,073 Acres**

NEED FOR CONSIDERING CHANGE FROM CURRENT DIRECTION

Wilderness use in 1980 was estimated to be 87,000 RVDs. This is projected to increase to 163,000 RVDs in 2030. The classified and recommended wilderness provide 52,013 RVDs of primitive recreation yearly. Use will increase in direct proportion to population growth.

Projected use will be far above the capability of the wilderness to supply a primitive recreation experience level under the Recreation Opportunity Spectrum concept. Use above the primitive level will be provided at a semi-primitive non-motorized recreation experience level.

PROJECTED WILDERNESS USE LEVEL

TIME PERIOD	1980	1981-1990	1991-2000	2001-2010	2011-2020	2021-2030
Average Annual RVDs	87,000	94,000	111,000	128,000	145,000	163,000

Wildlife

Public issues on how much wildlife habitat should be improved and to what extent indicated that the current wildlife program should be examined. Also concerns were expressed over number of elk the Forest could provide.

The current level of habitat improvement is 2,170 acre equivalents. The current elk population is 8,500 animals. The maximum potential elk population is 12,500 animals. To obtain this level, no livestock grazing would be permitted on National Forest big game winter range. Little or no timber harvest would be programmed on elk winter range. Habitat improvement would be scheduled to enhance forage supply. Additional winter range capacity during a severe winter would be needed on adjacent Federal, State, and private lands.

The desire to hunt, fish, and pursue a wide base of outdoor recreation activities in Montana is well demonstrated by the relatively high rate of participation by State residents and visitors. Nearly 3 out of 5 Montanans in the license-required group take part in one or more fishing or hunting activities. Another 170,000 visitors purchase out-of-state licenses. Nonconsumptive wildlife uses such as photography, nature study, and bird watching, are rapidly increasing. Projected use of the wildlife resource is expected to continue to rise over time.

NEED FOR CONSIDERING CHANGE FROM CURRENT DIRECTION

Range

The public issue on how much domestic livestock grazing should be provided indicated a change from current grazing levels should be examined.

The current domestic grazing level on the Forest is 72,282 animal unit months (AUMs).

Under the current management direction, grazing can be expected to remain static at 72,282 AUMs.

Under maximum production, grazing could increase from the present level of 72,282 AUMs to a high of The maximum production level reflects: (1) the highest consumptive use by domestic livestock that can be made on the ground without mechanical damage and/or vegetative damage; and (2) the production which must be left for non-consumptive allocations. The increase in forage production is attained by harvesting timber to create transitory range, investing in a high level of range improvements, establishing new allotments, and grazing riparian areas intensively.

The demand for grazing on the National Forest will be as great as allocated to domestic livestock use. Use of National Forest AUMs will require reasonable seasons and management requirements as they relate to the livestock industry.

RANGE
(Average Annual AUM's)

TIME PERIOD	1982-1990	1991-2000	2001-2010	2011-2020	2021-2030
Current Management	72,280	72,280	72,280	72,280	72,280
Maximum Physical Potential (90,000 Max Use)	90,000	90,000	90,000	90,000	90,000

NEED FOR CONSIDERING CHANGE FROM CURRENT DIRECTION

Timber

The public issues on timber harvesting indicate a change from the current timber program should be examined.

The current timber sales program is 13.0 million board feet per year (85 percent chargeable and 15 percent nonchargeable) on a land base of 554,213 acres of available, capable, and suitable Forest lands. Based on approved timber management plans with revisions to reflect RARE II (Roadless Area Review and Evaluation) and other decisions, the potential yield for the Forest is 17.2 million board feet.

Under the current management direction, timber harvest would remain stable, averaging 13 million board feet for the duration of the planning period. Current management maintains the wilderness character of classified wilderness, RARE II recommended wilderness, RARE II further planning areas, and Montana Wilderness Study Act areas. It also maintains the visual resource around developed recreation sites, summer homes, highways, and major roads.

The maximum timber production potential is 68.8 million board feet per year on 648,049 acres during the planning period (50 years). The maximum timber production potential retains the classified wilderness, RARE II recommended wilderness, and further planning areas. An additional 21.9 million board feet per year is available within these areas.

The maximum production potential is attained by harvesting all possible stands, intensively managing regenerated stands, converting stagnated stands into new stands, planting all non-stocked areas, and a ten-fold increase in budget.

This potential is limited by the Forest's ability to access and market timber, budget, and the need to protect other resource values. These values include wildlife, especially T&E (Threatened and Endangered) species, potential campgrounds, visual areas, and semi-primitive recreation areas.

The 1978 East Zone Timber Program Analysis concluded that because the supplies of private timber have been decreasing and the cost of harvesting has risen steadily in relation to National Forest timber costs, the demands for Forest timber should increase within the next five to ten years.

NEED FOR CONSIDERING CHANGE FROM CURRENT DIRECTION

TIMBER
(Average Million Board Feet per Year)

TIME PERIOD	1982-1990	1991-2000	2001-2010	2011-2020	2021-2030
Current Management	13.0	13.0	13.0	13.0	13.0
Maximum Opportunity	24.0	31.2	40.5	52.7	68.3

Minerals

Public issues on how much mineral exploration and development should be allowed indicate a change from current direction should be examined. Because the Forest manages only surface resources, it recommends what lands are available for leasing and what surface protection requirements are necessary.

A decription of the current situation for oil and gas follow:

In September 1979, an Environmental Assessment was completed on oil and gas leasing in the Highwood and Crazy Mountains. Under this environmental assessment, 23,704 acres in the Highwood Mountains and approximately 25,000 acres in the Crazy Mountains were leased. In January 1981, an Environmental Assessment was completed on oil and gas leasing in Deep Creek-Reservoir North RARE II Further Planning Area. Under this assessment, the Forest has recommended 42,000 acres be leased (34,440 acres with no-surface occupancy). Suit has been filed in U.S. District Court over this action. In February of 1981, the Forest completed an Environmental Assessment on Oil and Gas Leasing on Nonwilderness Lands. Under this environmental assessment, the Forest has completed recommendations to the Bureau of Land Management for lease issuance on 180 leases covering approximately 274,000 acres of the Rocky Mountain Division, and 17 leases covering approximately 92,000 acres in the Jefferson Division. Currently 692,000 acres are available for surface occupancy leasing. About 317,000 of these acres are leased.

The Bob Marshall, Scapegoat, and Great Bear Wilderness Complex were withdrawn from oil and gas leasing on June 1, 1981. This withdrawal was revoked on January 29, 1982. Congress is considering several legislative proposals dealing with minerals, leaseable minerals in wilderness, and with oil and gas leasing in the Bob Marshall Complex.

Under the maximum PNV benchmark, 750,000 acres would be available for surface occupancy leasing with standard stipulations.

Natural gas consumption in North America has grown from 9 percent of the total energy consumed in 1950 to 30 percent in 1975. In the U.S., over 40 million households and 3 million businesses rely on natural gas for an energy source.

Metallics and other minerals are described below:

The Jefferson Division of the Forest has a long history of silver, zinc, lead, sapphire, and gold production. Production has been mostly from small mines which produced intermittently up to the 1950's.

Exploration activity is at a moderate level. This includes geologic mapping, sampling, and a number of drilling projects every year. Development work is taking place in the Barker-Hughsville area on patented claims; some development work is taking place on unpatented claims. At present the Forest receives approximately 12-15 operating plans per year, mostly from small miners. Although the number of operating plans would increase in the future, production would not likely increase significantly during the planning period. Production would probably come from the Barker-Hughsville properties.

For most mineral commodities, except the common varieties, the market is worldwide. As a result, the mineral outputs provided by the Forest will not affect the price. However, quantity demanded is influenced by price.

Economic Efficiency

NFMA regulations, public issues, and management concerns indicate that ways the Forest carries out management activities should be examined. The maximum PNV benchmark and mininum level benchmark provides standards which other alternatives can be compared against for economic efficiency.

ALTERNATIVE DESCRIPTION

ALTERNATIVES DEVELOPED

The alternatives to be considered in detail and those eliminated from detailed study were identified after completing the analysis of the management situation. The preceding comprehensive benchmark analysis prevented the formulation of alternatives that could not be implemented. Even though a large number of alternatives could have been developed, effort was concentrated in developing a reasonable range of alternatives that could be analyzed within the limits set by the capability of the Forest and that were responsive to public issues and management concerns.

NFMA Requirements

NFMA requires that:

-- Each alternative will be capable of being achieved.

-- A no-action alternative will be formulated.

-- Each alternative will provide for the orderly elimination of backlogs needed to restore renewable resources.

-- Each identified major public issue and management concern will be addressed in one or more alternatives.

-- Each alternative will represent, to the extent practicable, the most cost-efficient combination of management practices that can meet the objectives established in the alternative.

NFMA regulations further require that each alternative state:

-- Conditions and uses resulting from the long-term application of the alternative.

-- Goods and services to be produced, and the timing and flow of these resource outputs.

-- Resource management standards and guidelines.

-- Purpose of the management direction proposed.

ALTERNATIVES ELIMINATED FROM DETAILED STUDY

The Forest developed and examined several alternatives that were eliminated from detailed analysis. No alternatives were formulated with timber and grazing outputs significantly below current levels. Output levels lower than the current levels were considered during alternative formulation and dismissed. Demands, social and economic implications, and impacts to other resources were considered in the analysis of the management situation.

Timber harvest levels much below 13 million board feet (current level) would have great impacts on the stability of timber dependent communities. The demand for Forest timber will increase over time, because the supply of private timber is decreasing. A reduction in volume would have little positive effect on other resources except semi-primitive recreation. Grazing levels below 72,000 animal unit months (current levels), likewise, would have a great impact on the stability of local ranches.

Wilderness Alternatives

NFMA regulations specify that lands reviewed in the Roadless Area Review and Evaluation (RARE II) Final Environmental Impact Statement and not designated as wilderness or for wilderness study will be managed for uses other than wilderness. No such area will be considered for designation as wilderness until the Forest Plan is revised.

Public Workshop Alternatives

The Forest developed six alternatives from public responses at a series of public workshops (see planning record, "Alternatives from Public Involvement," for details on process and results).

Two of the six alternatives became Alternatives A and C, and three others are similar to Alternatives B and C. The variations of Alternatives B and C from the public workshop alternatives centered on oil and gas leasing that the Forest had already made a decision on before completion of the Forest Plan. Because the three workshop alternatives could be represented by B and C without the oil and gas segments, they were considered as Alternatives B and C in detailed study.

The sixth public workshop alternative was eliminated from detailed study. This alternative called for a high level of timber harvest with a moderate level of grazing and minerals while maintaining dispersed recreation, developed recreation, wildlife habitat, and soil and water quality.

Based on the analysis of the management situation, maintaining wildlife habitat (particularly for big game) at the present level would not be possible with a high level of timber harvest and a moderate level of grazing. Therefore, this alternative was eliminated from detailed study. Also, other alternatives such as A, B, and E reflect similar outputs for range and timber, but these do have decreases in wildlife habitat which allow them to be feasible alternatives.

Management Team Alternatives

In addition to the alternatives identified from the public workshops, several others were added by the Forest management team. Alternatives D, E, and F were all studied in detail. Two other alterntives, RPA Low Bound and Departure to Reduce Timber Loss, were eliminated from detailed study.

RPA Low Bound

The RPA Low Bound alternative called for the Forest to follow the low bound outputs recommended in the 1980 RPA Assessment. The Revised President's Statement of Policy of December 1980 accepted only the high bound outputs as the Recommended Program. This alternative was eliminated from detailed study after that policy was released because it considered only low bound outputs.

Departure to Reduce Timber Loss

A significant loss of timber could result from epidemic infestations of the mountain pine beetle and associated mortality of lodgepole pine. An alternative was developed to test the feasibility of preventing catastrophic losses by harvesting highly susceptible trees before they are infested. This alternative departs from non-declining sustained yield.

This alternative would result in large volumes of timber being harvested over the first 4 decades at the same rate as the maximum timber benchmark. However, other resources such as wildlife habitat and semi-primitive recreation would be impacted adversely from large amounts of land being roaded and vegetation successional stages changed. For these reasons, this alternative was not considered for further detailed analysis.

ALTERNATIVES CONSIDERED IN DETAIL

NFMA regulations specify that a no-action alternative be developed. No action represents the most likely condition expected to exist in the future if the current plan were to continue unchanged. The current plan is the no-action alternative and is a basis for comparing all other alternatives.

Current Plan (No Action Alternative)

Management activities on the Forest are presently guided by Ranger District Multiple-Use Plans and Part I of the Forest Multiple-Use Plan. These plans emphasized delineation of management zones and developed coordination requirements to resolve land use conflicts. Since these plans were put into effect, legal changes and the RARE II (Roadless Area Review and Evaluation) have altered management direction in the following ways:

- The Scapegoat and Great Bear Addition to the Bob Marshall have been added to the National Wilderness Preservation System;
- Renshaw and Silver King-Falls Creek areas have been recommended for wilderness classification;
- Deep Creek-Reservoir North has been designated as a further planning area and will not be addressed in this plan until further information is available; and
- Middle Fork Judith and Big Snowies have been designated as wilderness study areas by the MWSA (Montana Wilderness Study Act).

In addition, advances in technical knowledge have made, it possible to determine more precisely the lands capability.

Under the current plan, the Forest produces a low level of timber products and a moderate level of livestock grazing. Currently, the Forest is producing 13 million board feet of timber and 72,300 AUMs (Animal Unit Months) of domestic grazing. Providing road access to undeveloped lands is emphasized. Wildlife habitat improvement is at a low level. Developed recreation opportunities would remain static; maintenance of these facilities is at a reduced service level. Over 456,000 acres have been leased or recommended for leasing for oil and gas exploration and development. Wilderness study areas are managed to protect their wilderness characteristics.

Alternative A

The goal of this alternative is to meet RPA Resource Planning Act) objectives. This alternative meets the direction in the "Revised President's Statement of Policy" which states that, "at least one alternative in the EIS will be developed to determine how the 1980 Forest and Rangeland Renewable Resources Planning Act (RPA) Program could be best implemented on the Forest."

The RPA Recommended Program for the Forest emphasizes high levels of timber harvest and livestock grazing accompanied by increases in roads for accessibility. Under this alternative, by 2030, 41.0 million board feet of timber would be harvested. Grazing would increase from 72,300 AUMs to 86,400 AUMs. There would be a decrease in elk and catchable trout populations; the wildlife habitat improvement program would triple. Developed recreation would increase about 32,000 RVDs (Recreation Visitor Days) by 2030. Although RPA objectives for dispersed recreation have already been met by the current management, dispersed recreation opportunities in a roaded natural appearing setting would increase significantly.

The Forest would recommend standard stipulation on additional oil and gas leases to protect surface resource values. This alternative would help meet the Nation's demand for renewable and nonrenewable resources.

Alternatives A-1 and A-2

MWSA areas would be either (A-1) recommended for wilderness classification or (A-2) managed with the rest of the Forest as described above.

Alternative B

The goal of this alternative is to increase the use of Forest resources while maintaining a variety of dispersed recreation opportunities.

Timber harvest and livestock grazing would increase to the midpoint between current management and the RPA Recommended Program. Under this alternative, by 2030, 23.7 million board feet of timber would be harvested. Grazing would increase from 72,300 AUMs to 81,400 AUMs. In emphasizing timber and grazing, corresponding emphasis on dispersed recreation opportunities in a roaded natural appearing setting would result. Select areas in a semi-primitive recreation setting would be maintained. Developed recreation would be at the current level of 198,000 RVDs. Wildlife habitat would not be stressed; rather, it would be dependent on timber and range developments.

The Forest would continue to recommend non-surface occupancy, limited surface use, and timing restrictions on all oil and gas leases.

Alternatives B-1 and B-2

MWSA areas would be (B-1) recommended for wilderness classification or (B-2) managed with the rest of the Forest as described above.

Alternative C

The goal of this alternative is to stress the Forest's abundant wildlife resource. Wildlife habitat would be maintained and improved. Both developed and dispersed recreation opportunities would increase. By 2030, an additional 15,000 RVDs of developed recreation would be provided. Most semi-primitive recreation opportunities would be maintained. Timber harvest would be slightly less than the current level of 13 million board feet; however, timber harvesting would be precluded in areas that are currently in a semi-primitive setting.

Additional oil and gas leasing with surface occupancy would be recommended only on areas which are currently accessible and which are not extremely sensitive. Timing restrictions would be recommended on most additional oil and gas leases to protect wildlife.

Livestock grazing would remain at the moderate level, but grazing would be allocated only if wildlife habitat objectives can be fully met.

MWSA areas would be managed for semi-primitive recreation and wildlife habitat, especially elk habitat, through habitat improvement practices.

Alternative D

The goal of this alternative is to respond to the increasing national and local demand for livestock grazing and outdoor recreation.

Livestock grazing would be increased to its maximum useable level of 90,000 AUMs. Dispersed recreation in a semi-primitive and roaded natural appearing setting would be emphasized. Many semi-primitive recreation opportunities would be maintained. Timber harvest would be precluded in these areas.

No-surface occupancy or limited surface use would be recommended for all additional oil and gas leases. Developed recreation opportunities would increase by 32,000 RVDs by 2030. To increase transitory range, timber would be harvested, at slightly less than the current level of 13 million board feet.

MWSA areas would be managed with the rest of the Forest as described above.

Alternative E

The goal of this alternative places emphasis on obtaining commodities where best suited.

The Jefferson Division would provide a high level of timber harvest and domestic grazing, accompanied by increases in roads for accessibility. Under this alternative, by 2030, 33.1 million board feet of timber would be harvested. Grazing would increase from 72,300 AUMs to 84,400 AUMs.

Dispersed recreation in a roaded natural setting would be emphasized. Developed recreation in the Jefferson Division would increase by 4,000 RVDs by 2030. The Forest would recommend standard stipulations on additional oil and gas leases to protect surface resource values.

In the Rocky Mountain Division, non-extractive uses such as wildlife habitat and semi-primitive recreation would be stressed. Timber would not be harvested on a regulated basis. The Forest would continue to recommend no-surface occupancy, limited surface use, and timing restrictions on all oil and gas leases in the Rocky Mountain Division.

Alternatives E-1 and E-2

MWSA areas would be either (E-1) recommended for wilderness classification, or (E-2) managed with the rest of the Forest as described above.

Proposed Action - Alternative F

The goal of this alternative is to increase the use of Forest resources and maintain dispersed recreational opportunities in a semi-primitive setting.

Developed recreation would increase by 32,000 RVDs by 2030.

Timber harvest and domestic grazing levels would be at a moderate level. By 2030, 24 million board feet of timber would be harvested. Timber harvest activities would be programmed only in those areas where extensive investments in roads would be commensurate with the values to be removed.

Livestock grazing would increase from 72,300 AUMs to 79,200 AUMs by 2030. Adverse impacts on wildlife habitat would be minimized through coordination. However, some increases in livestock grazing would occur on big game winter range and riparian zones.

The Forest would continue to recommend no-surface occupancy, limited surface use, and timing restrictions on most oil and gas leases.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed partly for commodity production and partly for semi-primitive recreation.

Departure

NFMA regulations allow a forest to depart from non-declining sustained yield if certain conditions are met. One of these conditions is high mortality losses from any cause that can be significantly reduced or prevented. A significant loss of timber could result from epidemic infestations of mountain pine beetle and associated mortality of lodgepole pine.

An alternative considered was departure from the Preferred Alternative. This departure alternative is different than the departure alternative that was not considered in detail. In this alternative the timber would increase to 28.1 million board feet after the fourth decade and then decline to the long-term sustained yield of the Preferred Alternative of 25.4 million board feet after that decade.

No departure schedule is recommended because it does not appear to provide the greatest net public benefit at this time.

Implementation of a departure schedule would require immediate increases in funding for collector roads, new road rights-of-ways, and personnel. Since the Forest lands have a lower timber productivity than some other Forests in the Region and nation, the higher costs to increase timber harvest would limit the Forest's ability to compete with other Forests for additional funds.

Lumber market conditions have not indicated a demand to support departure. There are no new sawmills proposed or any expansion planned at the existing sawmills within the local submarket area.

Management of other resources does not support the need to make the tradeoffs required for departure. Semi-primitive recreation setting by 2030 would decrease by 255,000 acres over the preferred alternative. The amount of acres for the modification visual quality objective would increase.

Alternative Allocation and Output Summary

The allocation of land to management emphasis by alternative is shown in Table 2.3. A summary of resource outputs for the alternatives and benchmarks is shown in Table 2.4.

Alternative Testing

Even within an alternative considered for detailed analysis, there was usually more than one way to accomplish the objectives of the alternative. Different ways to meet those objectives were reviewed and tested by the Forest management team, interdisciplinary team, and other Forest personnel to ensure that the alternative met on-the-ground conditions and best fit the management objectives for the alternatives. Maximum PNV was used to test variations within alternatives to ensure economic efficiency.

Further information on all alternatives is on file at the Forest Supervisor's Office.

Alternative Maps

Maps of each of the alternatives considered in detail can be found in the accompanying document, "Lewis and Clark National Forest Plan - Maps." Alternative maps show areas where timber harvest and additional road construction activities may occur, areas of concentrated dispersed recreation, and areas of special visual concern. Also listed is the allocation of land to management emphasis by mountain range.

TABLE 2.3

ALLOCATION OF ACRES TO MANAGEMENT EMPHASIS BY ALTERNATIVE

	MIN LEVEL	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)	MAX TIM	MAX PNV
Min. Level Mgmt	1395045	605583	383240	456162	431955	560976	695309	748053	435155	497565	849637	827343	670818	686935
Range Mgmt	0	294191	153427	181611	217514	258338	252480	297133	198350	221457	131242	131730	23532	23532
Timber Mgmt	0	179081	289260	347444	358862	400277	163034	180207	311129	417264	157676	183330	533129	456276
Timber/Range Mgmt	0	12364	132469	128347	56421	50241	40440	46663	55112	59545	127020	123997	110037	85073
Timber/Wildlife Visual Mgmt	0	4087	37386	63057	36890	15048	5725	10810	66331	55907	1346	645	2904	83287
Timber/Range/Wildlife/Visual Mgmt	0	0	6513	2824	633	519	0	1443	1479	1497	0	0	0	0
Wildlife Mgmt	0	52193	117673	120588	43138	48955	154200	43800	67932	71457	62028	60851	0	310
Wildlife/ Range Mgmt	0	221	28111	35743	2308	2257	25083	8463	12238	11932	10136	9914	0	101
Wilderness Mgmt	448350	448350	637235	448350	637235	448350	448350	448350	637235	448350	448350	448350	448350	448350
Wilderness Study Mgmt	0	230723	41838	41838	41838	41838	41838	41838	41838	41838	41838	41838	41838	41838
Campground Mgmt	0	1733	1768	1768	1733	1733	1753	1768	1733	1738	1768	1734	1734	1734
Concentrated Recreation Mgmt	0	14193	6887	10029	13440	13440	11793	13055	11917	11904	9092	8694	6141	14930
Concentrated Recreation/Range Mgmt	0	675	2109	5634	1428	1428	3390	1813	2946	2959	3296	4069	0	1029
Concentrated Recreation/Timber Mgmt	0	0	4099	0	0	0	0	0	0	0	0	0	0	0
Concentrated Recreation/Timber/ Range Mgmt	0	0	1374	0	0	0	0	0	0	0	0	1400	4912	0

1/ A description of the FORPLAN prescription grouped into these management emphases is given in Appendix C.

TABLE 2.4

SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE AND BENCHMARK LEVEL (Average Annual Output)

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	MIN LEVEL	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)	MAX TIM	MAX PNV
Rec. Use Potential by 2030	Thousand RVDs														
(Base Year 1980 in parentheses)															
- Rural	(194)	194	194	194	194	194	194	194	194	194	194	194	194	194	194
- Roaded Natural Appearing	(1905)	1905	2119	2303	2326	2178	2200	2094	2116	2248	2269	2202	2232	2435	2521
- Semi-Primitive	(218)	218	193	153	170	158	175	211	205	160	171	185	179	168	164
- Primitive	(52)	52	52	110	52	110	52	52	52	110	52	52	52	52	52
- Developed	(198)	0	198	230	230	198	198	213	230	203	203	230	230	198	198
Recreation Setting by 2030	Thousand Acres														
(Base Year 1980 in parentheses)															
-Wilderness	(448)	448	448	637	448	637	448	448	448	637	448	448	448	448	448
-Semi-Primitive	(889)	889	762	328	328	206	407	814	750	299	430	855	600	150	150
-Roaded Natural Appearing	(489)	489	616	861	1050	983	971	564	628	890	948	523	778	1228	1228
-Rural	(17)	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Wildlife															
- Habitat Improvement	Acre Eq.														
-1982-1990		0	2170	5490	5920	1980	2060	5820	2100	3320	3410	3250	3250	330	695
-2021-2030		0	2170	5370	5860	1890	2040	5820	2040	3230	3270	3150	3150	330	695
- Elk Population Potential	Number														
-1982-1990		8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	NA [1]	NA	8500
-2021-2030		10000	8500	8100	8000	8300	8200	9300	7800	8200	8100	8400	NA	NA	8600
- Elk Hunter Days	Thousand Hunter Days														
-1982-1990		65.0	63.9	63.9	63.3	63.9	63.9	63.9	62.9	63.5	63.5	63.9	NA	NA	63.9
-2021-2030		82.8	63.9	50.4	51.6	56.3	55.3	71.9	56.9	55.0	53.0	60.1	NA	NA	53.7
-Catchable Fish Potential	Thousand Fish														
-1982-1990		202	202	202	202	202	202	202	202	202	202	202	NA	NA	202
-2021-2030		212	202	167	174	186	186	208	170	192	192	190	NA	NA	186
Range	Thousand AUMs														
- 1982-1990		72.8	72.3	73.0	73.0	73.0	73.0	71.8	73.0	72.8	72.8	72.8	72.8	29.4	26.7
- 2021-2030		0	72.3	86.4	87.5	81.4	81.5	71.4	89.9	84.4	84.7	79.2	79.2	33.7	33.5
Timber															
- Land Available, Capable, and Suitable	Thousand Acres	0	196	473	542	452	466	209	226	433	534	286	309	651	622
- Programmed Sales Offered	Million Board Ft														
- 1982-1990		0	13.0	20.0	20.0	14.0	14.0	12.5	12.5	14.0	14.0	14.0	15.5	24.0	24.0
- 2021-2030		0	13.0	41.0	41.0	23.7	23.7	12.5	12.5	33.1	34.0	24.0	26.6	68.5	67.2
- Reforestation (Natural and Planting)	Acres														
- 1982-1990		0	1411	2094	2316	1531	1692	1433	1524	1520	1646	1501	2260	3092	2762
- 2021-2030		0	1228	3844	4134	3369	2850	1386	1172	3819	3998	2304	2042	6037	6642

[1] Not Available

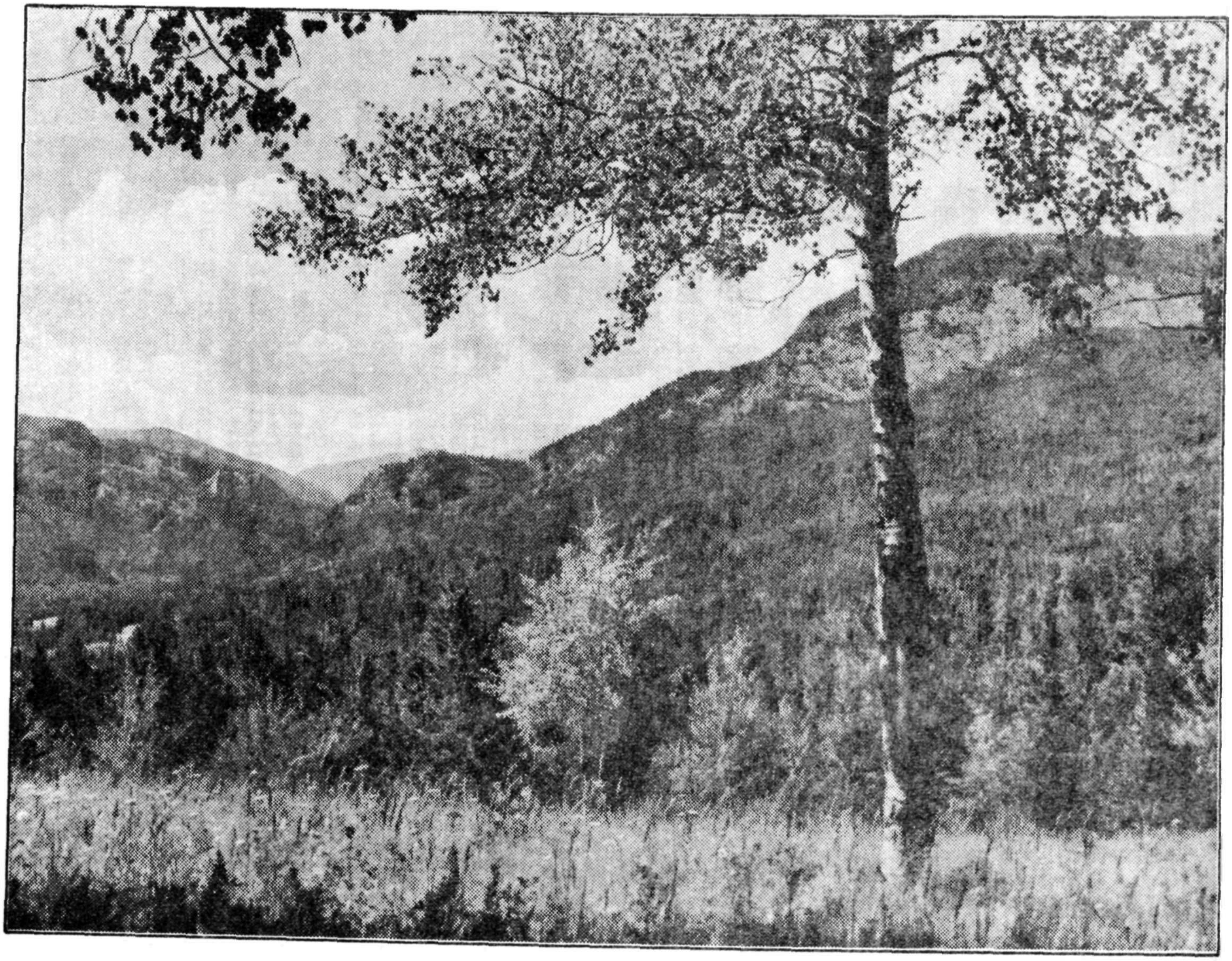
TABLE 2.4

SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE AND BENCHMARK LEVEL (Average Annual Output)

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	MIN LEVEL	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)	MAX TIM	MAX PNV
Timber (continued)	Million														
- Long Term Sustained Yield	Board Feet	0	14.3	41.1	43.5	32.6	33.6	18.3	16.0	34.6	38.8	25.4	26.4	68.8	43.8
Minerals															
- Lands available for Oil and Gas Occupancy Leasing	Thousand Acres	317	692	705	650	678	733	630	664	650	706	685	685	739	750
Roads															
- Arterial and Collector to be constructed	Miles														
- 1982-1990		0	4.5	5.2	5.2	4.5	4.5	4.5	4.5	4.5	4.5	4.5	5.2	5.2	5.2
- 2021-2030		0	5.1	17.9	19.1	5.4	10.1	1.5	2.8	6.5	17.4	4.8	10.1	48.0	47.0
- Local	Miles														
- 1982-1990		0	12.5	21.0	22.9	16.2	17.6	15.3	10.7	16.0	17.1	14.1	19.8	32.1	26.1
- 2021-2030		0	10.7	33.8	36.1	29.3	24.8	12.0	10.2	33.2	34.8	14.6	17.7	56.5	57.9
Prescribed burning (Average Annual)	Acres	0	6452	11994	11657	9488	8211	9568	8932	11044	9673	8697	9500	500	500
Social/Economic	Person-Year														
- changes in employment															
- 1982-1990		-246	0	186	186	24	23	1	1	16	13	23	34	NA 1/	94
- 2021-2030		-246	0	588	588	254	228	-6	17	422	403	260	196	NA	675
Returns to U.S. Government [2]	Million Dollars														
- 1982-1990		.40	.83	.99	.99	.86	.86	.82	.82	.83	.83	.83	.95	1.01	1.00
- 2021-2030		.40	1.07	2.27	2.27	1.53	1.53	1.05	1.08	1.92	1.95	1.54	1.83	3.52	3.52
- Present Value @ 4%		10.00	23.50	38.90	38.90	28.80	28.80	23.20	23.40	31.00	31.10	28.50	34.50	46.90	46.40
Total Budget required to implement [2]	Million Dollars														
- 1982-1990		2.71	3.87	4.65	4.82	4.10	4.17	4.20	4.06	4.04	4.16	4.31	4.94	4.71	4.49
- 2021-2030		2.64	4.03	8.13	7.42	4.97	5.24	4.17	4.55	5.62	6.49	5.41	6.40	9.60	8.62
Present Value Benefits [2] @ 4%	Million Dollars	198.49	374.81	651.23	694.24	544.41	544.43	387.38	400.16	559.79	587.62	522.69	553.56	834.44	862.31
- Excluding present value returns to U.S. Govt.		188.49	351.31	612.33	655.34	515.61	515.63	364.18	376.76	528.52	556.52	494.19	519.06	787.54	813.91
Present Value Costs [2] @ 4%	Million Dollars	77.31	199.68	400.94	446.10	301.82	315.10	212.90	219.77	311.69	350.92	305.41	329.78	577.60	560.17
Present Net Value [2]	Million Dollars														
- at 4%		121.2	175.2	250.3	248.1	242.6	229.3	174.5	180.4	248.1	236.7	217.3	223.8	256.8	302.1
- at 7-1/8%		58.4	75.0	183.6	103.1	100.5	94.2	77.5	73.9	100.7	96.2	92.1	94.8	92.9	113.9

[1] Not Available

[2] Values given in 1978 dollars



LOOKING UP FURMAN CREEK IN THE BOB MARSHALL WILDERNESS.

ALTERNATIVE COMPARISON

ALTERNATIVE COMPARISON

This part of the chapter compares the alternatives and selected benchmarks to current Forest management direction. This comparison is by RPA (Resource Planning Act) resource or support element. It also describes how the alternatives respond to the RPA program. The resolution of public issues and management concerns listed in Chapter I is also addressed.

ALTERNATIVE SUMMARY

ALTERNATIVE SUMMARY

This part of the chapter summarizes the comparison of alternatives.

Current Plan

The Current Plan fails to take advantage of opportunities to increase timber and range outputs where conflicts are minimal with other resource values. Employment and income opportunities would not change. Timber harvest on undeveloped lands is emphasized. Reasonable oil and gas development opportunities would be available. Current Plan retains only some of the semi-primitive lands of high public interest. The quality of elk hunting and threatened and endangered species habitat would decrease slightly. The Current Plan did not rank very high in PNV nor did it adequately address qualitative net public benefits.

Alternative A

Alternative A has the highest level of timber and range outputs and comes closest to meeting RPA objectives. Employment and income increases would be the greatest under this alternative. It would harvest timber on lands which are low in productivity, high in development cost, and environmentally more sensitive. Alternative A provides the highest opportunity for oil and gas development. The quality of elk hunting and threatened and endangered species habitat would be reduced the most of any alternative. Even though wildlife habitat improvement would triple, most of this increase would be directed at mitigating impacts of other programs. All the semi-primitive recreation areas of high public interest would be developed by 2030 except in Alternative A-1 where MWSA areas would be recommended for wilderness classification. Although Alternative A has the highest PNV, it ranks the lowest in terms of maximizing qualitative net public benefits.

Alternative B

Alternative B increases timber and range production moderately from the current level. Employment and income would increase. Reasonable oil and gas development opportunities would be available. Most of the area of high public interest would be developed. Alternative B ranks high in PNV, but is low in the evaluation of unquantified net public benefits. The quality of elk hunting and threatened and endangered species habitat would decrease significantly.

Alternative C

Alternative C, by maintaining timber harvest at slightly below current levels and decreasing domestic grazing, would fail to take advantage of opportunities to increase timber and range outputs where conflicts are minimal. This alternative showed slight decreases in employment and income.

Oil and gas development would have more restrictions. Nearly all areas of high public interest would be retained in a semi-primitive recreation setting with an emphasis on improving wildlife habitat. The quality of elk hunting and threatened and endangered species habitat would increase. Although this alternative had the lowest PNV, it would come closest to maximizing the qualitative net public benefits.

Alternative D

Alternative D maintains timber harvest at slightly below current levels and increases grazing to its maximum level. This increase in grazing would increase employment and income slightly. Alternative D foregoes the opportunity to increase timber outputs where conflicts are minimal with other resources. Oil and gas development would have more restrictions. The quality of threatened and endangered species habitat would be maintained. The quality of elk hunting would be expected to decrease due to the increase in grazing on big game winter ranges having an adverse effect on elk population. Most semi-primitive recreation areas of high public interest would be retained. Alternative D has a low PNV and also would decrease some of the qualitative net public benefits.

Alternative E

Alternative E, with high timber and range outputs for the Jefferson Division, would come closest to meeting RPA objectives for that part of the Forest. Large increases in employment and income would be realized for that area. This alternative would also harvest timber on lands which are low in productivity, high in development costs, and environmentally more sensitive. On the Rocky Mountain Front, where no development would be planned, oil and gas exploration would be more restrictive. All semi-primitive recreation areas of high public intent would be developed in the Jefferson Division, except in Alternative E-1 where the MWSA areas are recommended for wilderness classification. The quality of threatened and endangered species habitat would increase on the Rocky Mountain Front. However, the quality of elk hunting in the Jefferson Division would decrease considerably. Although the PNV of this alternative ranked fairly high, the qualitative net public benefits would be very low in the Jefferson Division.

ALTERNATIVE SUMMARY

Alternative F - Preferred

Alternative F provides for an increase in timber and range outputs in a cost effective manner while providing a wide range of dispersed recreation opportunities and maintaining important wildlife and fisheries habitat. There would be some increase in employment and income opportunities. This alternative best responds to the economic needs of the local people while fulfilling a greater share of regional and national needs. It minimizes the disturbance to important big game habitat and stresses wildlife coordination. Alternative F also provides a opportunity to explore and develop mineral resources. Almost all semi-primitive areas of high public interest would be retained. The quality of elk hunting decreases slightly, while the quality of habitat for threatened and endangered species is maintained at current levels. Although this alternative did not have the highest PNV, the interdisciplinary team felt this alternative came the closest to maximizing net public benefits.

Wilderness Study Areas

The Middle Fork Judith and Big Snowies Wilderness Study Areas are discussed in more detail in Section 2, Chapter II.

DEVELOPED RECREATION

Current available developed recreation opportunity on public land is 198,500 RVDs (recreation visitor days) on 31 sites occupying 195 acres. In addition, the private sector can provide 56,100 RVDs in downhill skiing and 33,500 RVDs in resort use. Current developed recreation use is 159,000 RVDs (1980).

Issues

- How many campgrounds or camping sites should be provided?

- What facilities should be provided at developed campgrounds?

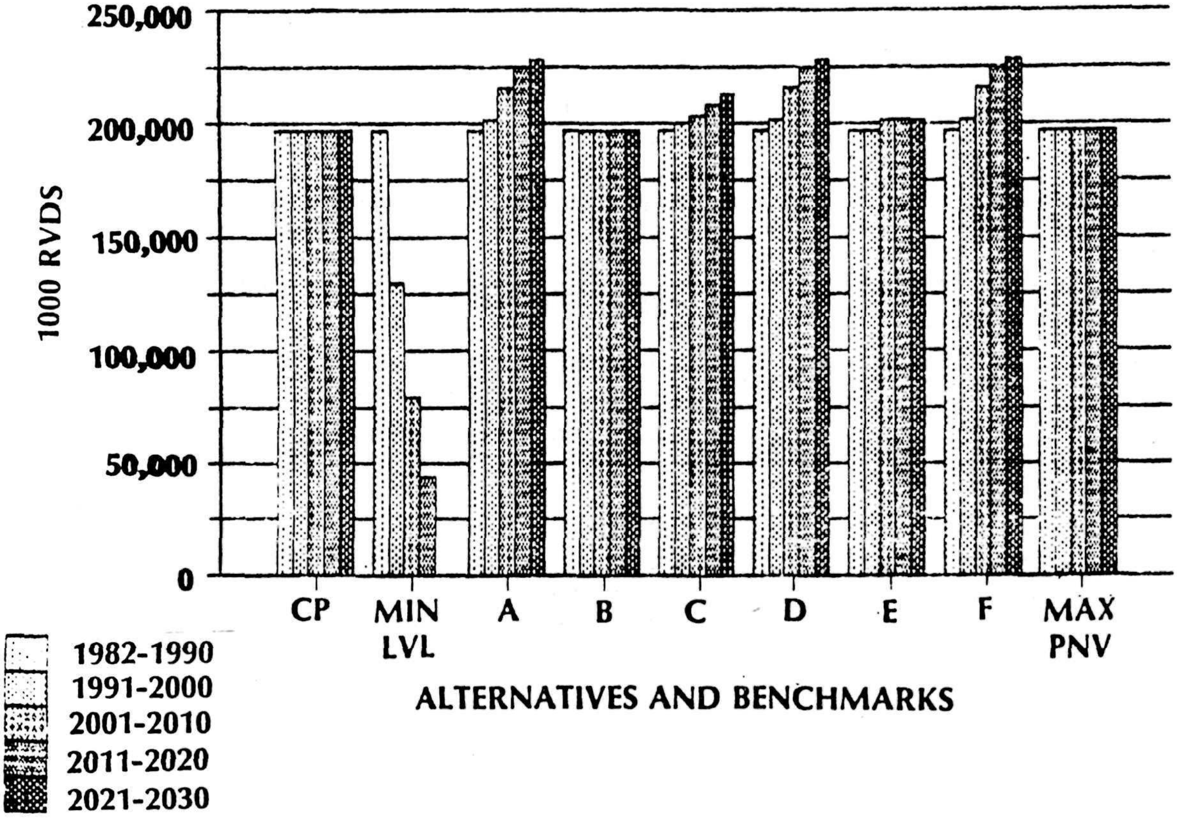
- Should existing summer home permits be continued?

Comparison

Figure 2.1 displays the projected developed recreation opportunity for each of the alternatives, the minimum level benchmark, and the maximum PNV benchmark.

FIGURE 2.1

PROJECTED DEVELOPED RECREATION OPPORTUNITY (2030)



Current Plan & Alternative B

Under current management direction and Alternative B, developed recreation would stay at the current level; no additional facilities would be built.

Alternatives A, D, & F - Preferred

Under these alternatives, developed recreation opportunity would increase from 198,500 RVDs in 1982 to 230,114 RVDs in 2030. This increase would be attained by expanding one existing site and developing seven new recreation sites on 36 acres. Development would begin in the 2nd decade by constructing one campground. Two campgrounds would be constructed in the 3rd, 4th, and 5th decades. Expansion would occur in decade 2.

Alternative C

Under this alternative, developed recreation opportunity would increase from 198,500 RVDs in 1982 to 213,114 RVDs in 2030. This increase would be attained by expanding one existing site and developing three new recreation sites on 18 acres. Expansion would occur in decade 2. One new campground would be built in decades 3, 4, and 5.

Alternative E

Under this alternative, developed recreation opportunity would increase from 198,500 RVDs in 1982 to 203,000 RVDs in 2030. This increase would be attained by developing one site in the Rocky Mountain Division in decade 3.

All Alternatives

The types of facilities at developed campgrounds would not change by alternatives.

Summer homes permits would continue equally under all alternatives. Summer home permits can be terminated if they are incompatible with public interest, or pose substantial physical conflicts with public needs. Also, termination action can be taken where permittees will not or cannot correct existing or anticipated unacceptable resource degradation, safety hazards, or unsanitary conditions.

Comparison to Benchmark's

Under the minimum level benchmark and maximum PNV benchmark, no campgrounds would be constructed. Campgrounds would be phased out under the minimum benchmark, as funds would not be available for maintenance and replacement of facilities.

RPA Recommended Program

None of the alternatives meet the Recommended RPA Program. The Recommended RPA Program of 454,650 RVDs is considerably more than the Forest's projected use level and the Forest's ability to supply developed recreation.

DISPERSED RECREATION

Current available dispersed recreation opportunity is 2,393,000 RVDs on the Forest. This includes 52,000 RVDs in a primitive setting (wilderness), 218,000 RVDs in a semi-primitive setting, 1,905,000 RVDs in a roaded natural appearing setting, and 194,000 RVDs in a rural setting. Recreation opportunity is the projected capacity of an area to provide dispersed recreation based on the area's recreation setting. Current dispersed recreation use is 622,200 RVDs.

Issues

- What recreation activities and use levels should be permitted?

- What opportunities for both summer and winter off-road vehicles should be provided?

- How much control (enforcement, closures, education) of off-road vehicles should be implemented?

Comparison

Figures 2.2 and 2.3 display the projected dispersed recreation opportunity and recreation setting in 2030 for each of the alternatives, the minimum level benchmark, and the maximum PNV benchmark.

FIGURE 2.2

PROJECTED DISPERSED RECREATION OPPORTUNITY (2030)

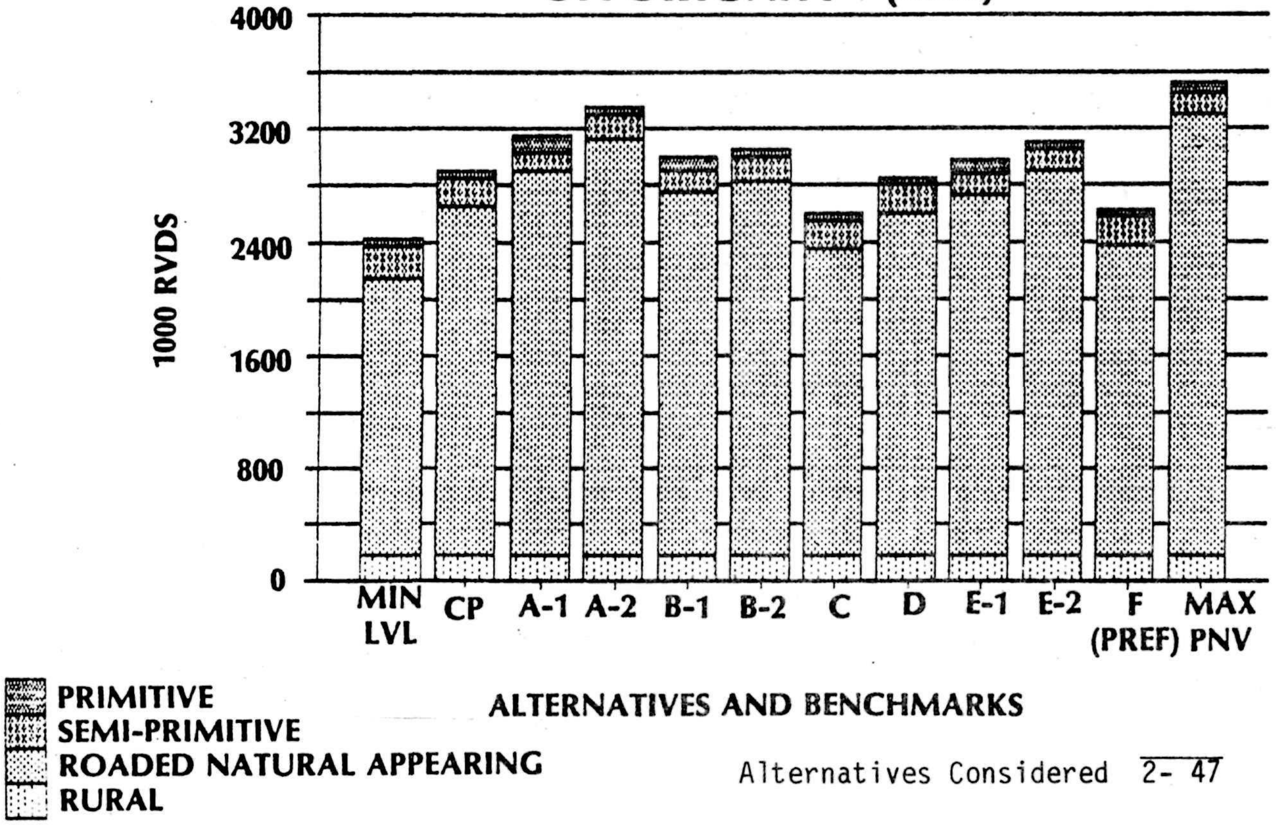
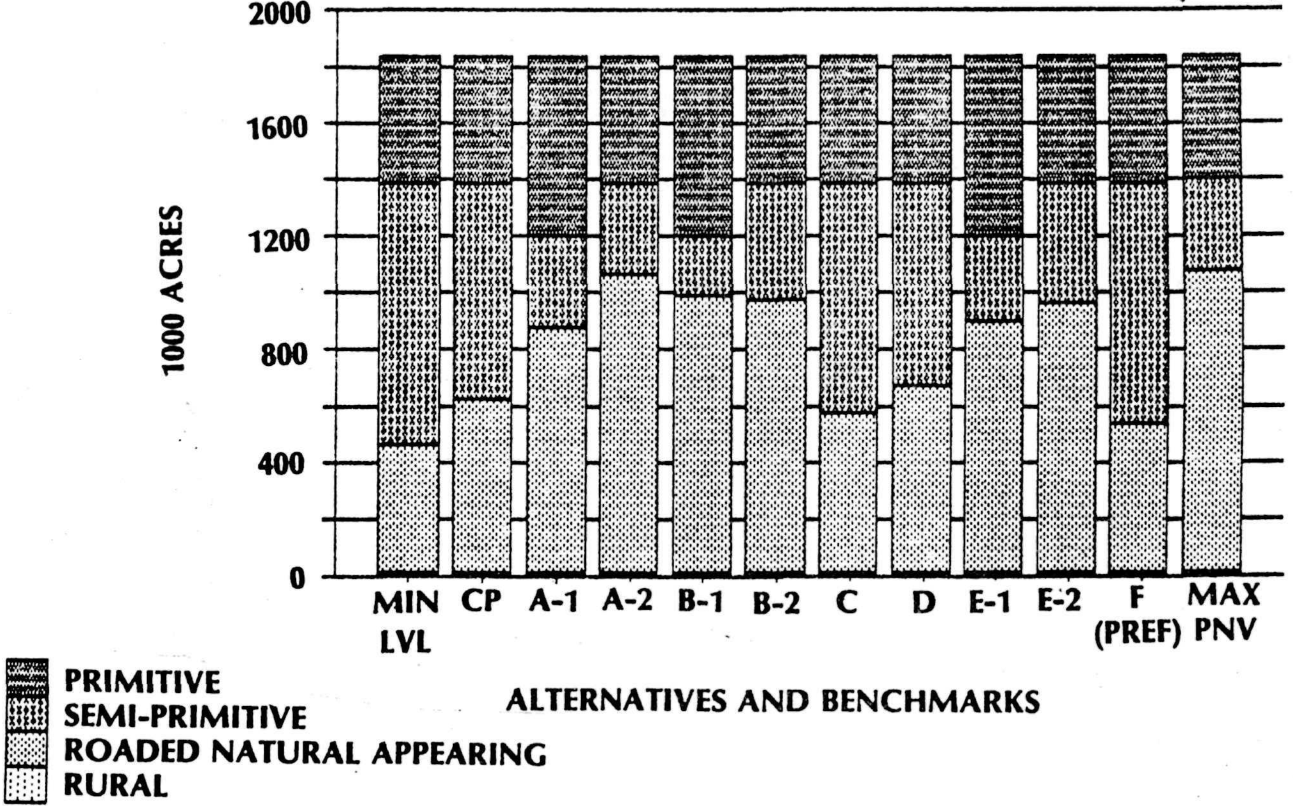


FIGURE 2.3

PROJECTED DISPERSED RECREATION SETTING (2030)



Current Plan

Under current management direction, the available dispersed recreation opportunity would increase from 2,348,136 RVDs in 1982 to 2,504,417 RVDs in 2030. Current management provides for maintaining existing trails and roads and accessing 69,000 acres of semi-primitive recreation settings.

Alternative A-1

Under Alternative A-1, the available dispersed recreation opportunity would increase from 2,348,136 RVDs in 1982 to 3,160,000 RVDs in 2030 by accessing 1,377,000 acres of semi-primitive recreation settings.

Alternative A-2

Under Alternative A-2, the available dispersed recreation opportunity would increase from 2,348,136 RVDs in 1982 to 3,371,000 RVDs in 2030 by accessing 566,000 acres of semi-primitive recreation settings.

Alternative B-1

Under Alternative B-1, the available dispersed recreation opportunity would increase from 2,348,136 RVDs in 1982 to 3,023,000 RVDs in 2030 by accessing 494,000 acres of semi-primitive recreation settings.

Alternative B-2

Under Alternative B-2, the available dispersed recreation opportunity would increase from 2,348,136 RVDs in 1982 to 3,068,000 RVDs in 2030 by accessing 482,000 acres of semi-primitive recreation settings.

Alternative C

Under Alternative C, the available dispersed recreation opportunity would increase from 2,348,136 RVDs in 1982 to 2,635,000 RVDs in 2030 by accessing 80,000 acres of semi-primitive recreation settings.

Alternative D

Under Alternative D, the available dispersed recreation opportunity would increase from 2,348,136 RVDs in 1982 to 2,881,000 RVDs in 2030 by accessing 184,000 acres of semi-primitive recreation settings.

Alternative E-1

Under Alternative E-1, the available dispersed recreation opportunity would increase from 2,348,136 RVDs in 1982 to 3,002,000 RVDs in 2030 by accessing 406,000 acres of semi-primitive recreation settings.

Alternative E-2

Under Alternative E-2, the available dispersed recreation opportunity would increase from 2,348,136 RVDs in 1982 to 3,130,000 RVDs in 2030 by accessing 459,000 acres of semi-primitive recreation settings.

Alternative F - Preferred

Under Alternative F, the available dispersed recreation opportunity would increase from 2,348,136 RVDs in 1982 to 2,633,000 RVDs in 2030 by accessing 39,000 acres of semi-primitive recreation settings.

All Alternatives

Recreation opportunities will be more visible under all alternatives. Winter recreational opportunities will be expanded. Off-road vehicles opportunities and controls will be determined through Forest Travel Planning. A Forest Travel Plan will be prepared for the Rocky Mountain Division and revised for the Jefferson Division as part of implementation of the Forest Plan.

Wilderness allocation is discussed under "Wilderness".

Comparison to Benchmark's

Under the minimum level benchmark, dispersed recreation opportunity would increase slightly to 2,353,000 RVDs as areas presently under contract for timber harvest are accessed. Under the maximum PNV benchmark, dispersed recreation opportunity would increase to 2,931,000 RVDs as semi-primitive recreation settings are accessed.

RPA Recommended Program

All of the alternatives meet the RPA Recommended Program. The Recommended RPA Program of 724,000 RVDs is considerably less than the Forest's projected use level and is also less than the Forest's ability to supply dispersed recreation.

CULTURAL RESOURCES	Cultural resources are managed under the Antiquities Act of 1906, the National Historic Preservation Act of 1966, the Archaeological and Historical Conservation Act of 1974, and the Archaeological Resource Protection Act of 1979.
Management Concern	- How can the Forest carry out identification, protection, interpretation, and management of cultural resources? - What is the best way to provide special management protection to special management areas?
Current Plan	The focus has been to inventory on a project-by-project basis prior to design and implementation of activities which impact the cultural resources and cooperation with the Blackfeet Indian Tribe to identify possible sacred sites.
Alternative A	Generally, the risk of damage to cultural resources increases with development and access, so this alternative would possess the greatest risk to the Forest's cultural resources. Project work would continue to require inventory of sites and implementation of appropriate mitigating measures.
Alternative B & Alternative F - Preferred	These alternatives have moderate development. Areas allocated to intensive management activities would have the greatest risk of damage. Project inventory and evaluation would continue.
Alternative C & D	These alternatives would possess low development. The potential risk of damage to cultural resources would be slight, but these alternatives place some emphasis on interpretation increasing the public's enjoyment of the Forest.
Alternative E	More risk of damage would occur in the Jefferson Division, which would be under intensive management. In the Rocky Mountain Division the risk would be low because of less development activities.
All Alternatives	The cultural resources program will identify, protect, interpret, and manage cultural resources. Coordination with the Blackfeet Indian Tribe will continue. Special interest areas including caves, archaelogical sites, and areas containing rare or unusual vegetation will also receive special protection under all alternatives.
RPA Recommended Program	No RPA assignment exists for cultural resources.

VISUAL RESOURCES

Current management direction holds the Forest budget and outputs at existing levels. Under these assumptions, preservation and retention visual quality objective acres would remain the same as the existing VQO (Visual Quality Objective).

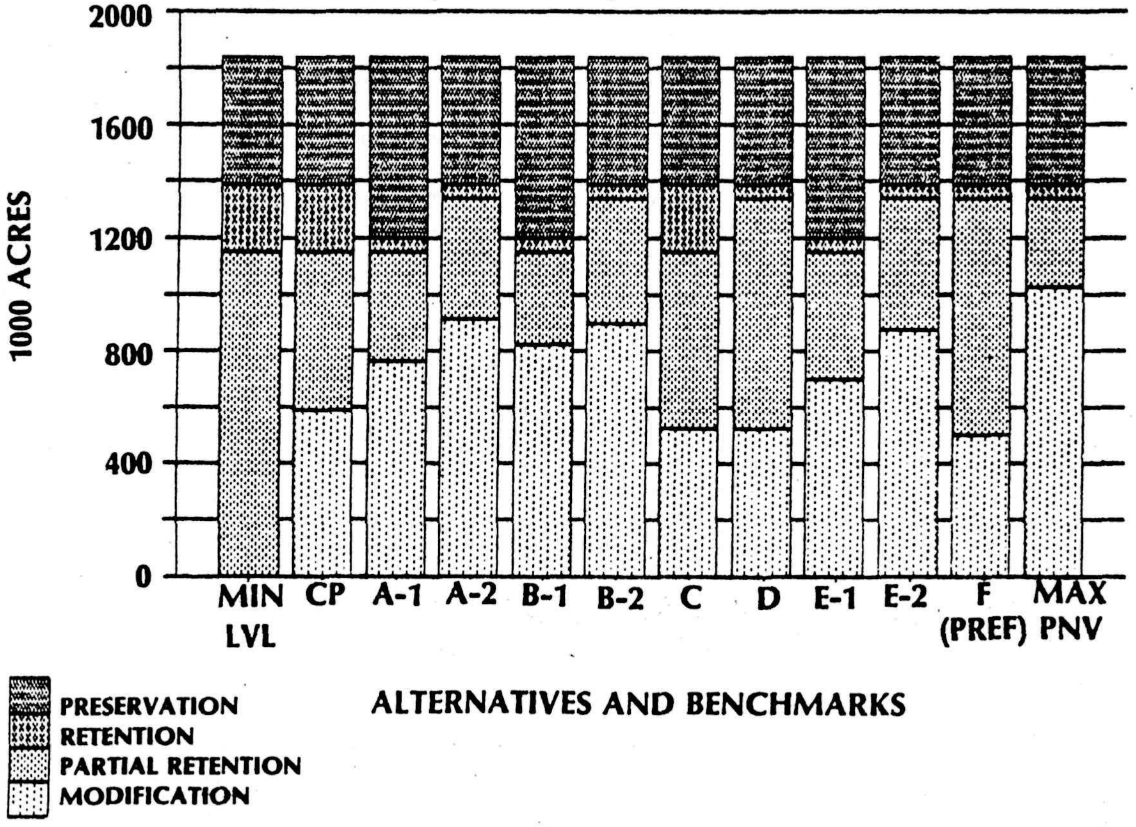
Comparison

Table 2.4 displays the VQOs of the alternatives at the end of the planning horizon (150 years).

FIGURE 2.4

VISUAL QUALITY OBJECTIVES (2030)

(1000 ACRES)



RPA Recommended Program

No RPA assignment exists for visual resources.

Research Natural Area	One area, Paine Gulch near Monarch in the Little Belts, has been recommended as a research natural area.
Management Concern	- How can the Forest identify candidate research natural areas containing specific grassland, shrub, and Forest habitat type and acquatic ecosystems to meet regional targets?
All Alternatives	Forest-wide evaluation criteria will be used in the selection of candidate areas to meet regional targets.

WILDERNESS	National Forest System Wilderness is managed under the Wilderness Act of 1964, and the Code of Federal Regulations - Title 36 Part 293 - Wilderness Primitive Areas.
Issues	- Should the amount of wilderness use be controlled and how? - Should the Deep Creek/Reservoir North RARE II further planning area be recommended to Congress for inclusion in the National Wilderness Preservation System? As part of the Forest planning process, the Regional Forester is making preliminary recommendations on the Middle Fork Judith Wilderness Study Area and the Big Snowies Wilderness Study Area (see Purpose and Need, Chapter I).
Current Plan	The Middle Fork Judith and Big Snowies Wilderness Study Areas are managed to protect their wilderness character until Congress decides on their classification.
Alternative A-1	The Middle Fork Judith and Big Snowies Wilderness Study Areas would be recommended for wilderness classification. This would add 188,885 acres to the National Wilderness Preservation System.
Alternative A-2	The Middle Fork Judith and Big Snowies Wilderness Study Areas would be managed for intensive commodity production. The opportunity for wilderness classification would be foregone.
Alternative B-1	The Middle Fork Judith and Big Snowies Wilderness Study Areas would be recommended for wilderness classification. This would add 188,885 acres to the National Wilderness Preservation System.
Alternative B-2	The Middle Fork Judith and Big Snowies Wilderness Study Areas would be managed for moderate commodity production. The opportunity for wilderness classification would be foregone.
Alternative C	The Middle Fork Judith and Big Snowies Wilderness Study Areas would be managed to provide semi-primitive recreation opportunities and wildlife habitat. The opportunity for further wilderness classification would remain.

Alternative D	The Middle Fork Judith and Big Snowies Wilderness Study Areas would be managed to provide semi-primitive recreation opportunities and wildlife habitat. The opportunity for further wilderness classification would remain.
Alternative E-1	The Middle Fork Judith and Big Snowies Wilderness Study Areas would be recommended for wilderness classification. This would add 188,885 acres to the National Wilderness Preservation System.
Alternative E-2	The Middle Fork Judith and Big Snowies Wilderness Study Areas would be managed for intensive commodity production. The opportunity for wilderness classification would be foregone.
Alternative F - Preferred	About 26,400 acres of the Middle Fork Judith Wilderness Study Areas would be managed for commodity production (upper Middle Fork). The opportunity for wilderness classification would be foregone. The remaining 64,600 acres would be managed for wildlife and semi-primitive recreation. The Big Snowies Wilderness Study Areas would be managed for semi-primitive recreation. The opportunity for further wilderness classification on these two areas would remain.
All Alternatives	Wilderness use for the Bob Marshall/Great Bear/Scapegoat Wilderness Complex will be managed the same under all alternatives. Under all alternatives efforts to gather data on oil and gas potential in the Deep Creek/Reservoir North RARE II further planning area will continue. Once data on oil and gas potential is available, a wilderness recommendation will be made through an amendment or revision to the Forest Plan.
Comparison to Benchmark's	Under the minimum level benchmark, the Middle Fork Judith and Big Snowies Wilderness Study Areas would be managed for semi-primitive recreation. Under the maximum PNV benchmark the study areas would be developed for commodity production.
RPA Recommended Program	No RPA assignment exists for wilderness. Information from the planning process will be used in the 1985 RPA update.

WILDLIFE
T & E SPECIES

Under all alternatives, threatened and endangered wildlife (T&E species) would be protected as required by the Endangered Species Act of 1973.

Issues

- How much oil and gas activity can be accepted and still meet the intent of the Endangered Species Act?

All Alternatives

The greatest potential impact would be from oil and gas development in the Rocky Mountain Division. Such development would mainly affect grizzly bear. The amount, kind, and timing of these activities would determine the impacts. The environmental assessment on Oil and Gas Leasing on Nonwilderness Lands provides the basis for the application of lease stipulations which are designed to protect T&E species and their habitat. The Endangered or Threatened Species stipulation is standard and applies to all leases. The activity coordination stipulation has been and would be attached to all leases which include occupied T&E species habitat covering the entire Rocky Mountain Division of the Forest.

WILDLIFE AND FISH
Other

Currently it is estimated that there are 8,500 elk and 202,000 catchable trout on the Forest. Elk hunting provides about 65,000 days of recreation annually. A variety of wildlife habitat improvement projects including protection fencing, planting of forage species, prescribed burning, water development, bank stability and cover, pool development, and barrier removal are done to maintain and improve wildlife habitat.

Issues

- How much fish and wildlife habitat should be improved and to what extent?

- How and where should range be provided for elk and cattle?

- How should conflicts be resolved between wildlife and management activities of: domestic livestock grazing; timber; oil and gas exploration and development; minerals; recreation; and wilderness?

Comparison

Figures 2.5, 2.6. and 2.7 show elk, catchable trout populations, and wildlife habitat improvement by alternative, minimum level benchmark, and maximum PNV benchmark. Figure 2.8 shows hunter recreation.

FIGURE 2.5

ELK POPULATION

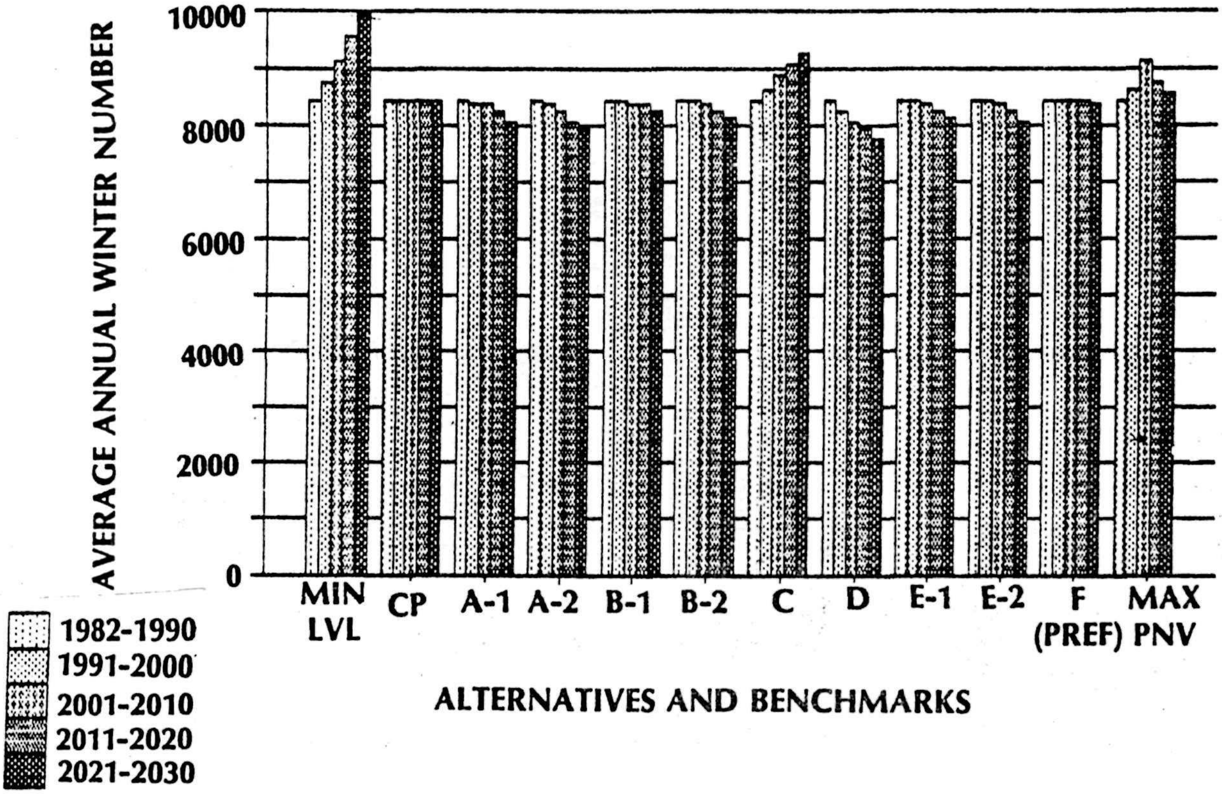


FIGURE 2.6

CATCHABLE TROUT

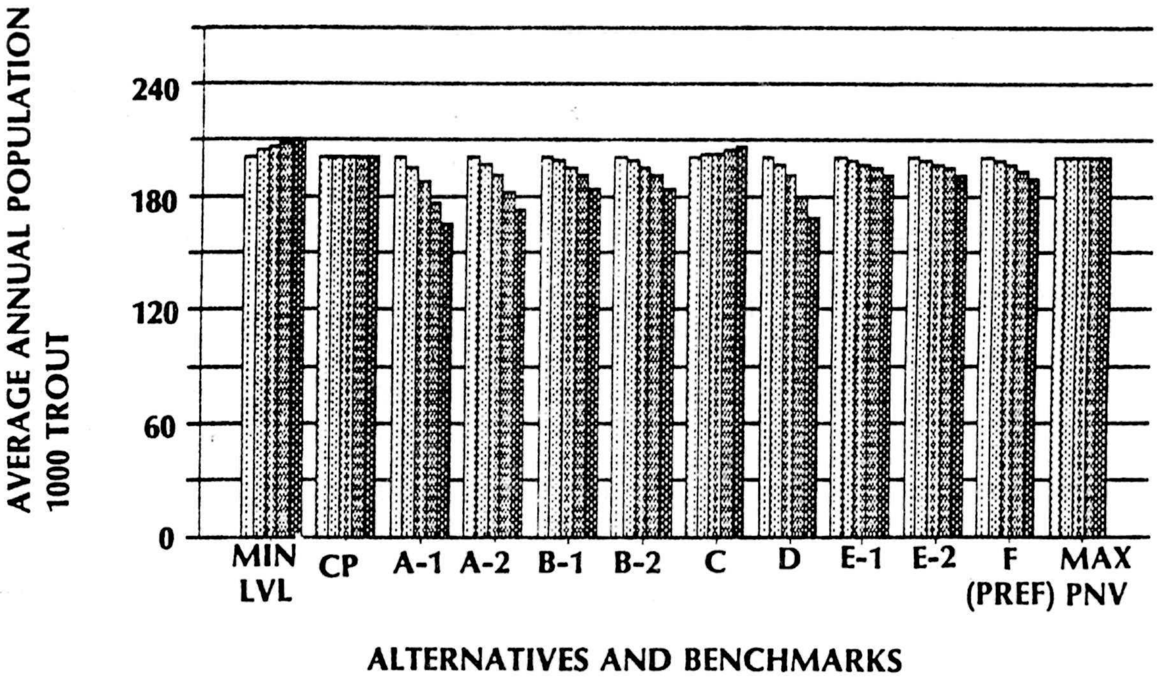


FIGURE 2.7

WILDLIFE HABITAT IMPROVEMENT

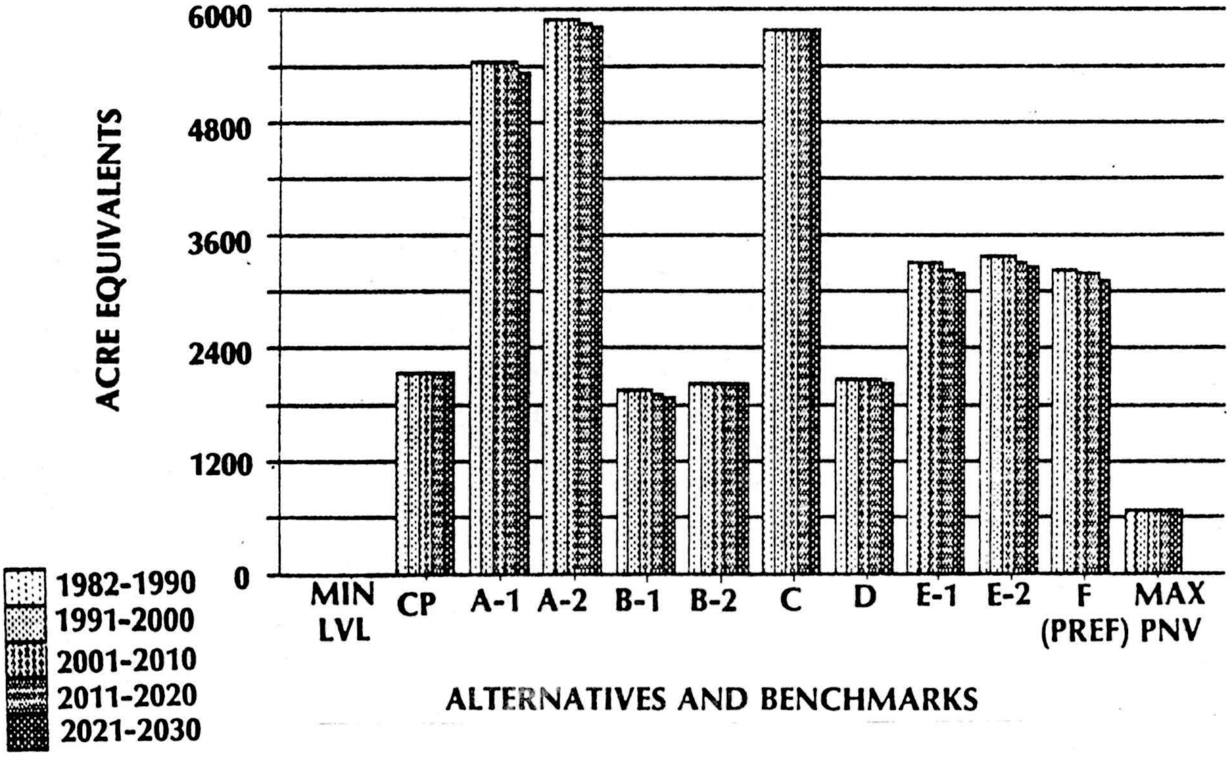
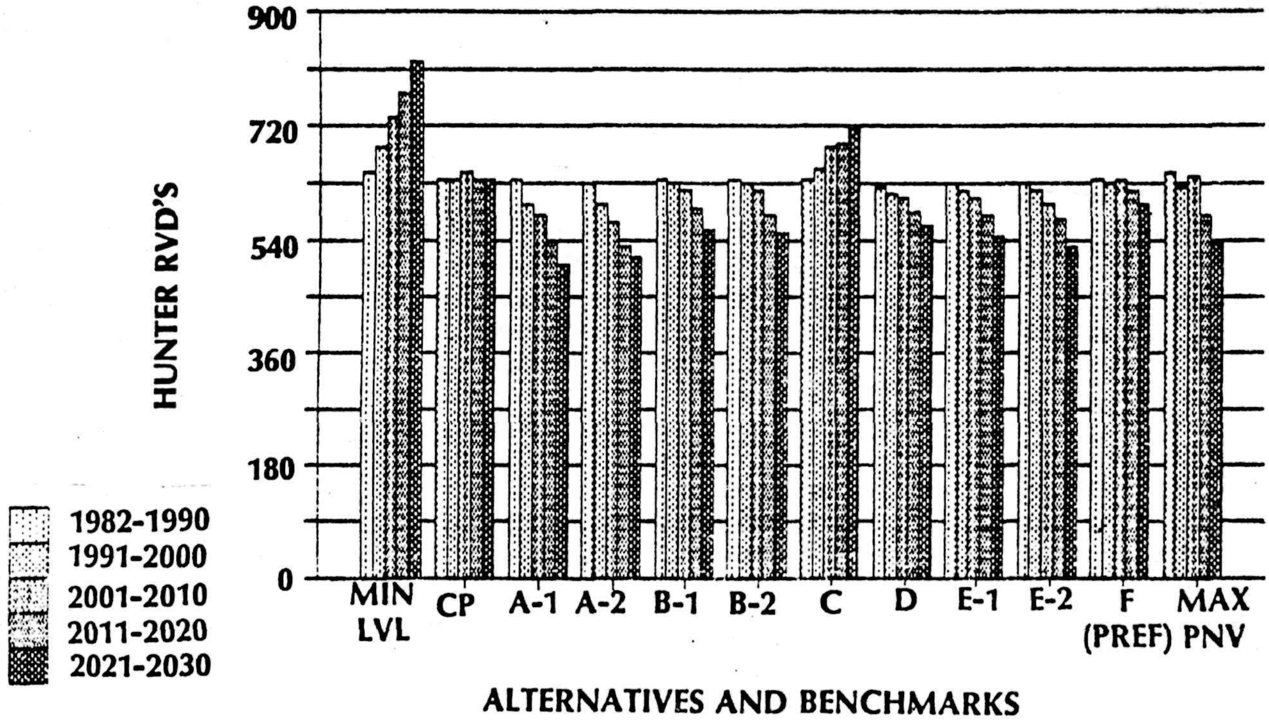


FIGURE 2.8

ELK HUNTER DAYS



Current Plan

Under current management, elk and catchable trout population would not change. Elk hunter recreation would remain relatively stable at the Current level. The average wildlife habitat improvement would be 2,170 acre equivalents annually including 330 acre equivalents for T&E species and 40 acre equivalents for fish.

Alternative A-1

By 2030, elk numbers would decrease from 8,500 to 8,100 animals because of increases in grazing on winter range and timber harvesting on unroaded lands. Elk hunter recreation would decrease by 14,500 days annually. Catchable trout would decrease from 202,000 to 167,000 fish because of grazing in riparian zone and harvesting timber on a regulated basis in the zone. Wildlife habitat improvement would increase to 5,370 acre equivalents.

Alternative A-2

By 2030, elk populations would decrease from 8,500 to 8,000 animals and catchable trout numbers would decrease from 202,000 to 174,000 fish because of increases in grazing and timber harvest levels. Wildlife habitat improvement would increase to 5,860 acre equivalents. Elk hunter recreation would decrease by 13,500 days annually.

Alternative B-1

There would be a decrease in elk numbers from 8,500 to 8,300 animals and catchable trout from 202,000 to 186,000 fish because of increases in grazing and timber harvest levels by 2030. Wildlife habitat improvement would be 1,890 acre equivalents just above the current level. Elk hunter recreation would decrease by 8,500 days annually.

Alternative B-2

By 2030, there would be a decrease in elk numbers from 8,500 to 8,200 animals and catchable trout from 202,000 to 186,000 fish because of increases in grazing and timber harvest levels. Wildlife habitat improvement would increase slightly to 2,040 acre equivalents. Elk hunter recreation would decrease by 9,500 days annually.

Alternative C

This alternative provides protection and improvement of wildlife areas. Wildlife habitat improvement would be done on 5,820 acre equivalents yearly. By 2030, this improvement would result in increasing the elk population from 8,500 to 9,200 animals and the catchable trout population from 202,000 to 208,000 fish. Elk hunter recreation would decrease by 7,000 days annually.

Alternative D

By 2030, elk numbers would decrease from 8,500 to 8,200 animals and catchable trout from 202,000 to 192,000 fish because of the large increase in grazing. Wildlife habitat improvements would increase to 2,040 acre equivalents. Elk hunter recreation would decrease by 8,000 days annually.

Alternative E-1

By 2030, elk numbers would decrease from 8,500 to 8,200 animals and catchable trout from 202,000 to 192,000 fish reflecting the increase in grazing and timber harvest levels. Wildlife habitat improvements would increase to 3,230 acre equivalents. Elk hunter recreation would decrease by 10,000 days annually.

Alternative E-2

By 2030, elk numbers would decrease from 8,500 to 8,100 animals and catchable trout from 202,000 to 192,000 fish reflecting the increase in grazing and timber harvest levels. Wildlife habitat improvements would increase to 3,270 acre equivalents. Elk hunter recreation would decrease by 12,000 days annually.

Alternative F - Preferred

By 2030, elk numbers would decrease from 8,500 to 8,400 animals because of the increases in grazing and timber harvest levels. Elk hunter recreation would decrease by 5,000 days annually. Catchable trout would decrease from 202,000 to 190,000 fish. Wildlife habitat improvements would increase to 3,150 acre equivalents.

All Alternatives

Coordination between wildlife and fish habitat management and other management activities will be stressed under all alternatives.

Comparison to Benchmark's

Under the minimum level benchmark no investment would be made in wildlife habitat improvement. Domestic grazing and timber harvest would cease. Elk populations would increase by 1,500 animals. Catchable trout would be increased by 10,000 fish. Under the maximum PNV benchmark, 695 acres of wildlife habitat improvement would be done. Elk numbers would increase by 100 animals in the early decades because of the decrease in grazing. In later decades elk numbers would decline because of increases in timber harvest levels. Catchable trout would decrease from 202,000 to 186,000 due to timber harvesting in the riparian zone.

RPA Recommended Program

Alternative A-2 meets the RPA Recommended Program for wildlife habitat improvement which averages 6,300 acres equivalents yearly. Alternative A-1 meets the RPA Recommended Program by about 90 percent; Alternative C - 85 percent; Alternative F 56 percent; Alternative E-2 - 55 percent; Alternative E-1 - 50 percent; and Alternatives B-1, B-2, and D by about 35 percent of the RPA Recommended Program.

None of the alternatives met the State target for elk numbers.

RANGE

The current domestic grazing level is 72,280 AUMs (animal unit months).

Issues

- How much domestic livestock grazing should be provided?

- How and where should range be provided for cattle?

- Can and should the range structural and non-structural improvement program be improved and how?

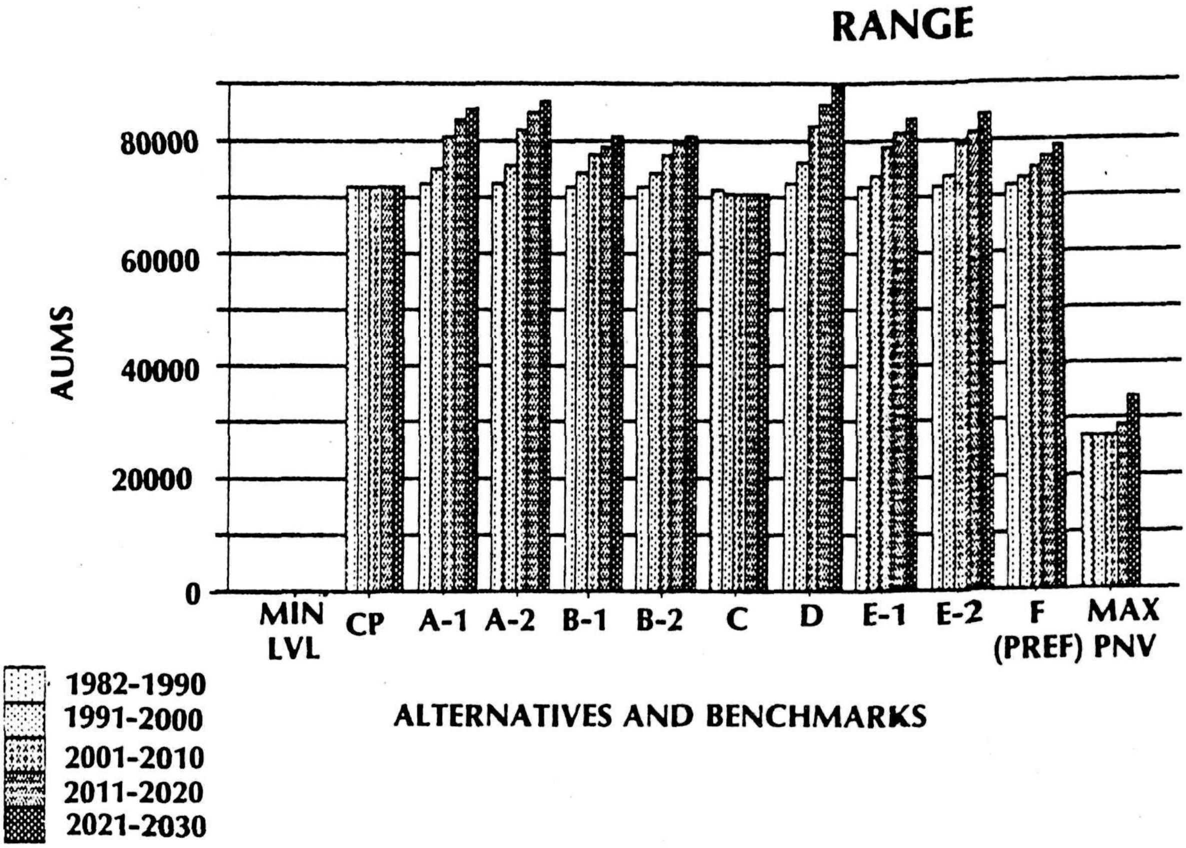
- How can control of noxious weeds be improved and to what extent?

- What are the effects of the following on domestic grazing; Clean Water Act; early hunting season; wilderness management; wildlife management; timber management; recreation management; and how can these impacts be resolved?

Comparison

Figure 2.9 displays domestic grazing AUMs for the alternatives, minimum level benchmark, and maximum PNV benchmark.

FIGURE 2.9



Current Plan	Under current management direction, grazing would remain static at 72,280 AUMs during the planning period. Current management direction would provide for no range deterioration caused by domestic livestock and would improve distribution of animals on existing allotments.
Alternative A-1	Grazing would increase from 72,280 to 86,400 AUMs by 2030. To achieve this level, timber would be harvested to create transitory range, moderate investments would be made in range improvements, new allotments would be established.
Alternative A-2	Grazing would increase from 72,280 to 87,500 AUMs by 2030. This increase would be achieved as described in A-1.
Alternative B-1	Grazing would increase from 72,280 to 81,350 AUMs by 2030. This increase would be achieved by harvesting timber to create transitory range, making low investments in range improvements, and establishing new allotments.
Alternative B-2	Grazing would increase from 72,280 to 81,500 AUMs by 2030. This increase would be achieved as described in B-1.
Alternative C	Grazing would decrease from 72,280 to 71,420 AUMs by 2030. Grazing would be decreased to protect key wildlife habitat areas.
Alternative D	Grazing would increase from 72,280 to 89,900 AUMs by 2030. This increase would be achieved by harvesting timber to create transitory range, making high investments in range improvements, and establishing new allotments.
Alternative E-1	Grazing would increase from 72,280 to 84,370 AUMs by 2030. This increase would be made on the Jefferson Division and would be achieved as described in Alternative D.
Alternative E-2	Grazing would increase from 72,280 to 84,670 AUMs by 2030. Increases are similar to E-1.
Alternative F - Preferred	Grazing would increase from 72,280 to 79,200 AUMs by 2030. To achieve this level and minimize conflicts with big game, timber would be harvested to create transitory range, moderate investments would be made in range improvements, and distribution of grazing would be improved.

All Alternatives

The range improvements program and control of noxious weeds are the same under all alternatives.

The effects of other management activities on domestic grazing are discussed in Chapter IV.

Comparison to Benchmark's

Under the minimum level benchmark, domestic grazing permits would not be reissued. Under the maximum PNV benchmark, grazing would decrease to 33,500 AUMs by 2030.

RPA Recommended Program

Alternative D meets the RPA Recommended Program of 90,000 AUMs; A-1 and A-2 about 95 percent, B-1, B-2, E-1, and E-2 about 90 percent, Alternative F about 88 percent, and C about 80 percent of the recommended program. The RPA Recommended Program is the maximum usable production potential.

TIMBER

The current timber sale program is 13.0 million board feet per year.

Issues

- How much timber should be harvested?

- How can timber sales be prepared to provide proper coordination with other resources?

- Should sales, including timber salvage, be planned on uneconomical areas?

- What degree of slash cleanup should be required after timber harvest?

- What clearcutting, if any, should be allowed and how could clearcutting be coordinated with other uses?

- How much and what kind of reforestation is appropriate?

- Should permits be required for free firewood cutting and what controls should be established?

Comparison

Figure 2.10 displays the timber harvest levels by alternative, minimum level benchmark, maximum PNV benchmark, and maximum timber potential benchmark for the first 5 decades. Table 2.5 shows acres harvested, acres clearcut, acres precommercially thinned, and total volume harvested for the first 5 decades. Figures 2.11, 2.12, and 2.13 display timber harvest for 15 decades.

FIGURE 2.10

ANNUAL TIMBER HARVEST PROGRAM

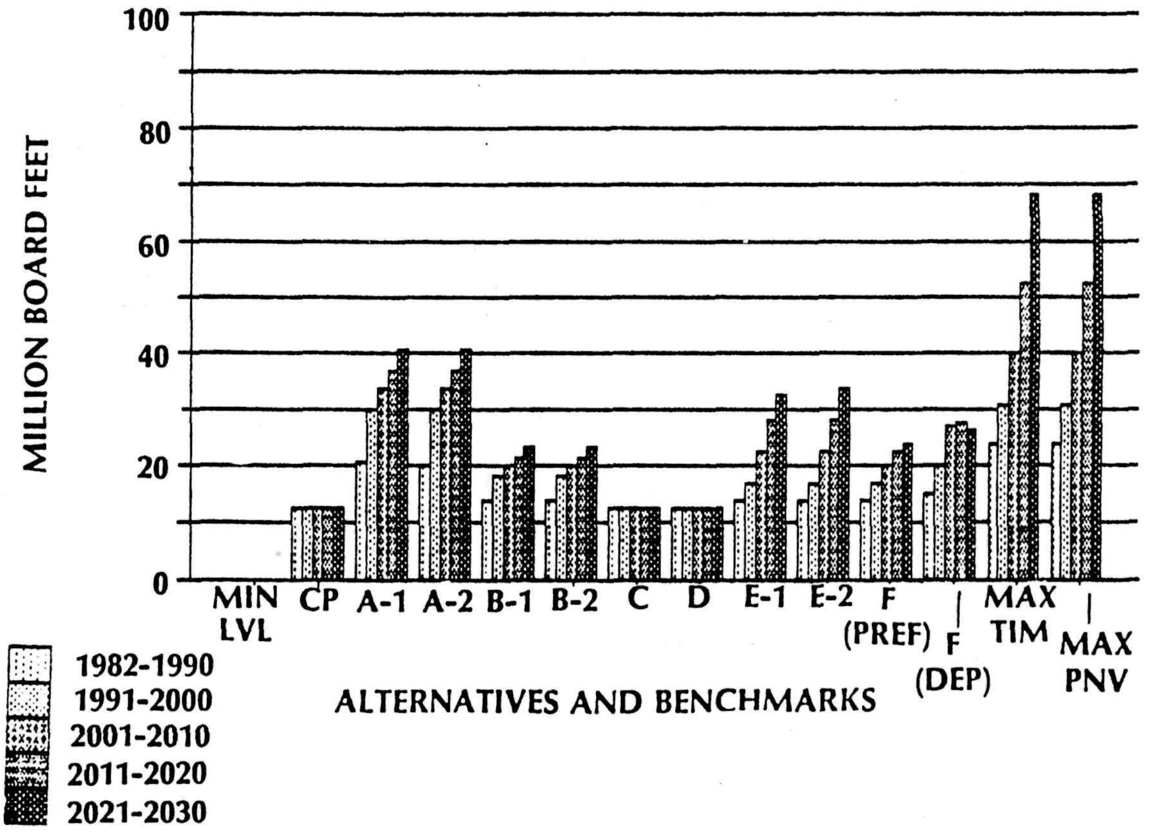


TABLE 2.5 ANNUAL TIMBER HARVEST PROGRAM BY TIME PERIOD

DECADE	Current Plan	A-1	A-2	B-1	B-2	C	D
1982-1990							
Total Volume Harvested	13.0(3.8)	20.0(5.9)	20.0(5.9)	14.0(4.1)	14.0(4.1)	12.5(3.7)	12.5(3.7)
Precom. Thin Acres	165	1074	764	122	238	192	215
Acres Harvested *	1411	2094	2316	1531	1692	1433	1524
Acres Clearcut	840	961	1002	728	849	756	806
1991-2000							
Total Volume Harvested	13.0(3.8)	30.0(8.8)	30.0(8.8)	18.2(5.4)	18.2(5.4)	12.5(3.7)	12.5(3.7)
Precom. Thin Acres	170	1454	1099	166	322	161	211
Acres Harvested	1183	3316	3328	2070	2373	1204	1496
Acres Clearcut	705	1522	1441	985	1191	635	791
2001-2010							
Total Volume Harvested	13.0(3.8)	34.0(10.0)	34.0(10.0)	20.3(6.0)	20.3(6.0)	12.5(3.7)	12.5(3.7)
Precom. Thin Acres	211	1258	1191	138	175	97	137
Acres Harvested	930	2835	3554	1960	2152	898	976
Acres Clearcut	554	1301	1538	932	1080	474	516
2011-2020							
Total Volume Harvested	13.0(3.8)	37.0(10.9)	37.0(10.9)	21.8(6.4)	21.8(6.4)	12.5(3.7)	12.5(3.7)
Precom. Thin Acres	177	2270	2250	409	672	110	409
Acres Harvested	1237	3619	4094	2969	2927	1437	1115
Acres Clearcut	737	1661	1772	1413	1469	758	590
2021-2030							
Total Volume Harvested	13.0(3.8)	41.0(12.1)	41.0(12.1)	23.7(7.0)	23.7(7.0)	12.5(3.7)	12.5(3.7)
Precom. Thin Acres	140	2041	1614	176	522	372	81
Acres Harvested	1228	3833	4134	3369	2850	1386	1172
Acres Clearcut	731	1759	1790	1603	1430	731	620

DECADE	E-1	E-2	F (PREFER)	F (DEPART)	MAX TIM	MAX PNV
1982-1990						
Total Volume Harvested	14.0(4.1)	14.0(4.1)	14.0(4.1)	15.5(4.6)	24.0(7.1)	24.0(7.1)
Precom. Thin Acres	613	198	126	126	334	298
Acres Harvested *	1520	1646	1581	2260	3092	2762
Acres Clearcut	685	694	794	1177	1391	1295
1991-2000						
Total Volume Harvested	17.0(5.0)	17.0(5.0)	17.0(5.0)	20.1(5.9)	31.2(9.2)	31.2(9.2)
Precom. Thin Acres	601	235	133	133	371	331
Acres Harvested	1898	1943	1660	2588	3536	3502
Acres Clearcut	855	819	833	1348	1591	1642
2001-2010						
Total Volume Harvested	22.8(6.7)	22.8(6.7)	20.0(5.9)	27.1(8.0)	40.5(11.9)	40.5(11.9)
Precom. Thin Acres	151	148	130	186	464	414
Acres Harvested	2199	2553	1622	2064	2629	4276
Acres Clearcut	991	1077	814	1075	1183	2005
2011-2020						
Total Volume Harvested	28.2(8.3)	28.2(8.3)	23.0(6.8)	28.1(8.3)	52.7(15.5)	52.7(15.5)
Precom. Thin Acres	672	237	196	306	530	525
Acres Harvested	2888	3077	2450	2235	5426	6447
Acres Clearcut	1302	1298	1230	1164	2442	3024
2021-2030						
Total Volume Harvested	33.1(9.7)	34.0(10.1)	24.0(7.1)	26.6(7.8)	68.3(20.1)	68.3(20.1)
Precom. Thin Acres	522	780	184	234	394	641
Acres Harvested	3819	3998	2304	2042	6037	6642
Acres Clearcut	1722	1687	1157	1064	2717	3115

*Acres harvested includes acres regeneration cut by shelterwood and clearcut methods.

The following figures show the timber harvest level through 2130 (150 years).

FIGURE 2.11

TIMBER HARVEST (thru 2130)

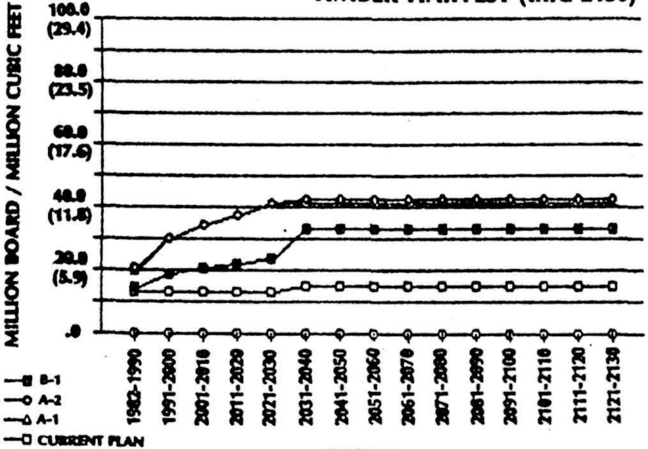


FIGURE 2.12

TIMBER HARVEST (thru 2130)

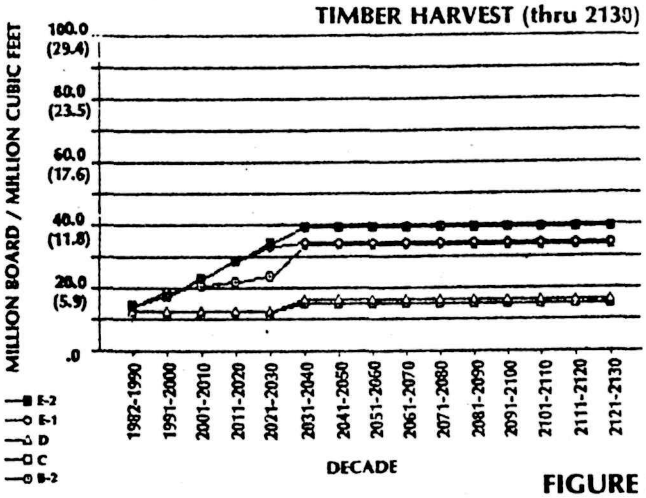
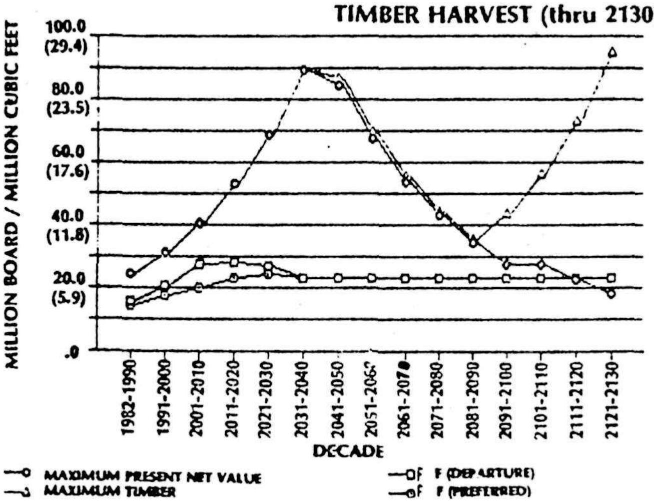


FIGURE 2.13

TIMBER HARVEST (thru 2130)



Current Plan

Under current management direction, timber harvest would remain stable, averaging 13 million board feet (3.8 million cubic feet) for the duration of the planning period. This alternative would retain 86 percent of semi-primitive recreation settings and would harvest 2 percent of the steep, low productivity sites in the Jefferson Division.

Current management maintains the wilderness character of classified wilderness, RARE II recommended wilderness, RARE II further planning areas, and MWSA areas, and maintains the visual resource around developed recreation sites, summer homes, highways, and major roads.

Alternative A-1

Under this alternative, 41 million board feet (12.1 million cubic feet) of timber would be offered for sale annually in 2030. This alternative would retain 37 percent of the semi-primitive recreation settings and would add 12,000 acres of commercial forest lands in the riparian zones to the regulated harvest base and 4,200 acres of rural recreation settings to the regulated harvest base. It would harvest 95 percent of steep, low productivity sites in the Jefferson Division. MWSA areas would not be harvested.

Alternative A-2

Under this alternative, 41 million board feet (12.1 million cubic feet) of timber would be offered for sale annually in 2030. This alternative would retain 37 percent of the semi-primitive recreation settings including the Middle Fork Judith and Big Snowies MWSA areas. It would not add any riparian zones or rural recreation settings to the regulated harvest base. It would harvest 90 percent of the steep, low productivity sites in the Jefferson Division. MWSA areas would be harvested.

Alternative B-1

Under this alternative, 23.7 million board feet (7.0 million cubic feet) of timber would be offered for sale annually in 2030. This alternative would involve non-intensive timber management and would schedule harvest on the more productive timber sites throughout the Forest. Semi-primitive recreation would be retained on 23 percent of the Forest. It would not add any riparian zones or rural recreation settings to the regulated harvest base. It would harvest 70 percent of the steep, low productivity sites in the Jefferson Division. MWSA areas would not be harvested.

Alternative B-2

Under this alternative, 23.7 million board feet (7.0 million cubic feet) of timber would be offered for sale annually in 2030. It would schedule timber harvest on the more productive sites throughout the Forest, although 46 percent semi-primitive recreation opportunities would be maintained. It would not add any riparian zones or rural recreation settings to the regulated harvest base. It would harvest 70 percent of the steep, low productivity sites in the Jefferson Division. MWSA study areas would be harvested.

Alternative C

Under this alternative, 12.5 million board feet (3.7 million cubic feet) of timber would be offered for sale annually in 2030. This alternative would involve extensive timber management. It would not add any riparian zones or rural recreation settings to the regulated harvest base. It would harvest 25 percent of the steep, low productivity sites in the Jefferson Division. Most (92 percent) semi-primitive recreation settings would be retained.

Alternative D

Under this alternative, 12.5 million board feet (3.7 million cubic feet) of timber would be offered for sale annually in 2030. This alternative would involve extensive timber management. It would not add any riparian zones or rural recreation settings to the regulated harvest base. It would harvest 5 percent of the steep, low productivity sites in the Jefferson Division. Most (80 percent) semi-primitive recreation settings would be retained.

Alternative E-1

Under this alternative, 33.1 million board feet (9.7 million cubic feet) of timber would be offered for sale annually in 2030. This alternative would involve intensive timber management in the Jefferson Division. It would not add any riparian zones or rural recreation settings to the regulated harvest base. It would harvest 70 percent of the steep, low productivity sites in the Jefferson Division. Of semi-primitive recreation settings, 34 percent would be retained. No regulated timber harvest would take place in the Rocky Mountain Division. MWSA areas would not be harvested.

Alternative E-2

Under this alternative, 34.0 million board feet (10.0 million cubic feet) of timber would be offered for sale annually in 2030. This alternative would involve intensive timber management in the Jefferson Division. It would not add any riparian zones or rural recreation settings to the regulated harvest base. It would harvest 98 percent of the steep, low productivity sites in the Jefferson Division. Some (48 percent) of semi-primitive recreation settings would be retained. No regulated timber harvest would take place in the Rocky Mountain Division. MWSA areas would be harvested.

Alternative F - Preferred

Under this alternative, 24 million board feet (7.1 million cubic feet) of timber would be offered for sale annually in 2030. This alternative would involve extensive timber management on those areas allocated to timber management. It would harvest timber on the most economical sites on the Forest. This alternative would add 1,131 acres of commercial forest land in riparian zones to the regulated harvest base, and no acres of rural recreation setting to the regulated base. This alternative would maintain 96 percent of the semi-primitive recreation setting, the most of any alternative. It would harvest 15 percent of the steep, low productivity sites in the Jefferson Division. The upper part of the Middle Fork Judith MWSA area would be harvested.

All Alternatives

Timber sale coordination with other resources is the same under all alternatives. Slash cleanup and firewood cutting and control are the same under all alternatives. Reforestation is the same under all alternatives. The Forest relies on natural regeneration for most of its reforestation. About 10 percent of the sites have to be planted.

Effects of Alternatives on Available, Capable and Suitable Lands for Timber Production

Available and capable lands for timber production were identified in the analysis of the management situation. These lands met the minimum requirement that:

1) The land had not been withdrawn from timber production;

2) The biological growth potential for the land is greater than or equal to 20 cubic feet per acre per year;

3) Technology is available that will ensure timber production from the land without irreversible resource damage to the land; and

4) These lands can be restocked in 5 years after a regeneration harvest.

Suitability of land for timber production varies by alternative. Reasons for this variation are:

1) Based upon a consideration of multiple-use objectives for the alternative, the land is proposed for resource uses that precludes timber production, such as wilderness;

2) Other management activities for the alternative limit timber production activities; or

3) The lands are not cost-efficient in meeting timber management objectives for production for the alternative under consideration.

Acres of available, capable, and suitable lands were calculated by summing the acres which include a management emphasis providing for the harvest of timber. These acres, by management emphasis, are listed in Table 2.3. Available, capable, and suitable acres by alternatives, and maximum timber benchmark, and maximum PNV benchmark are listed in Table 2.6.

Lands considered suitable always involve a regulated harvest during the next 150 years. Lands considered unsuitable may, in most cases, be considered for unregulated harvest such as post and pole cutting and firewood removal.

TABLE 2.6 ACRES BY LAND CLASS

ALTERNATIVE	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)	MAX TIM	MAX PNV
Total Acres = 1,843,395													
Water	4,655	4,655	4,655	4,655	4,655	4,655	4,655	4,655	4,655	4,655	4,655	4,655	4,655
Non-Forest	482,205	482,205	482,205	482,205	482,205	482,205	482,205	482,205	482,205	482,205	482,205	482,205	482,205
Forest Acres													
A. Not Capable 1/	491,475	491,475	491,475	491,475	491,475	491,475	491,475	491,475	491,475	491,475	491,475	491,475	491,475
B. Not Available													
-Prod Reserved 2/	185,145	185,145	185,145	185,145	185,145	185,145	185,145	185,145	185,145	185,145	185,145	185,145	185,145
-Prod Deferred 3/	125,702	125,702	21,612	125,702	21,612	21,612	125,702	21,612	21,612	21,612	21,612	21,612	21,612
C. Not Suited													
-Incompatible w/ Mgmt direction 4/	358,680	80,799	116,625	101,407	192,232	448,939	431,541	120,522	124,117	372,261	349,431	10,254	36,008
D. Suitable 5/	195,533	473,414	541,678	452,806	466,071	209,364	226,762	433,691	534,186	286,042	308,872	648,049	622,295

1/ The biological growth potential for this land is less than 20 cubic feet per acre.

2/ This land has been withdrawn from timber production (Wilderness and Experimental Forest).

3/ This land has been withdrawn from timber production pending further study or recommendations (RARE II Recommended Wilderness, RARE II Further Study, and in some alternatives, MWSA areas).

4/ Acres available in the FORPLAN model but not selected for timber allocation. This includes nontimber prescriptions for specific sites within analysis areas, such as Research Natural Areas and campgrounds.

5/ Lands considered suitable always involve a regulated harvest during the next 150 years. Lands considered unsuitable may, in most cases, be considered for unregulated harvest such as post and pole cutting and firewood removal.

Long-Term Sustained Yield Growth

The "Revised President's Statement of Policy" calls for commercial timber lands to have been brought to and maintained at, where possible, 90 percent of LTSY (Long Term Sustained Yield) by 2030 consistent with provisions of NFMA. Figure 2.14 displays LTSY and growth at 2030 of benchmarks and alternatives. Table 2.7 shows the LTSY; growth at 2030, and percent of growth at 2030 of LTSY.

FIGURE 2.14

GROWTH AT 2030 AND LONG TERM SUSTAINED YIELD

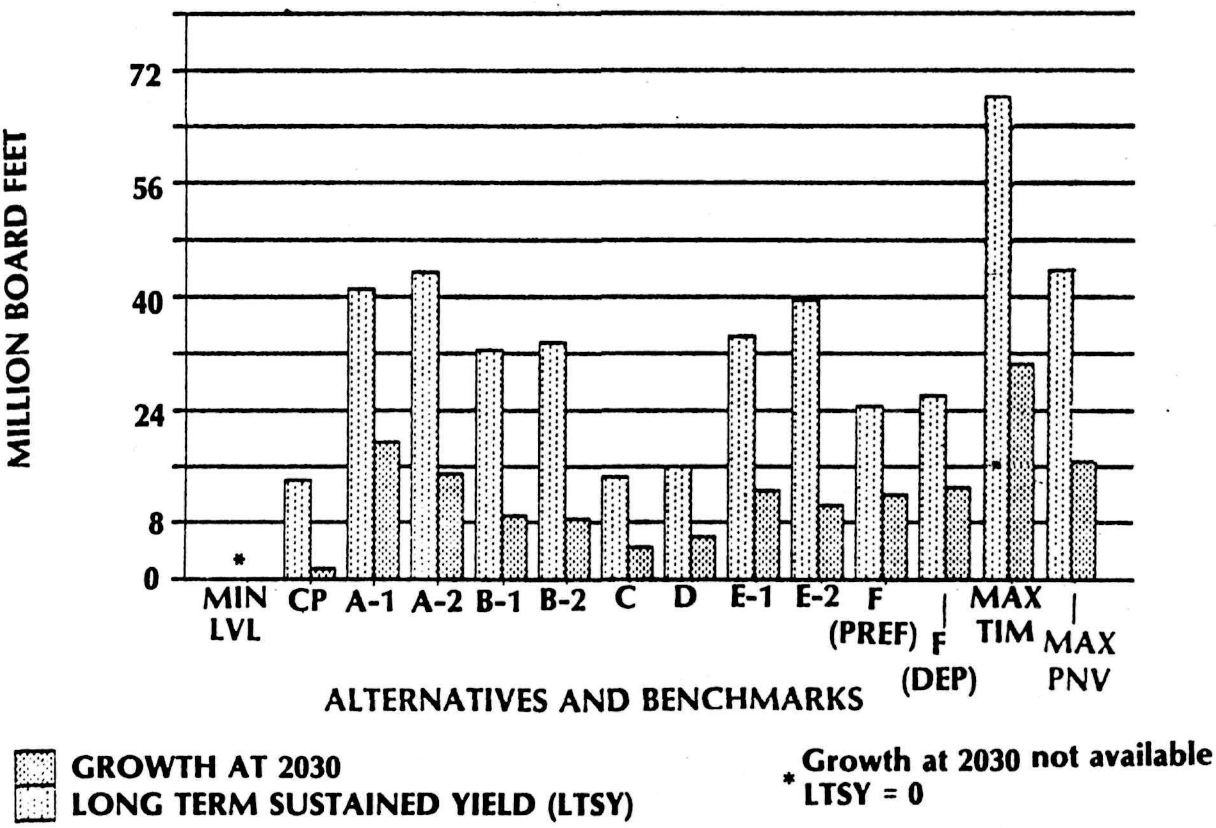


TABLE 2.7 LTSY AND GROWTH AT 2030

	LTSY Million Board Feet Million Cubic Feet	GROWTH AT 2030 Million Board Feet Million Cubic Feet	GROWTH AT 2030 OF LTSY (Percent)
Current Plan	14.3(4.2)	1.7(.5)	12
A-1	41.1(12.1)	19.5(5.7)	47
A-2	43.5(12.8)	15.0(4.4)	34
B-1	32.6(9.6)	9.2(2.7)	28
B-2	33.6(9.9)	8.5(2.5)	25
C	18.3(5.4)	4.7(1.4)	31
D	16.0(4.7)	6.1(1.8)	37
E-1	34.6(10.2)	12.5(3.7)	36
E-2	38.8(11.7)	10.6(3.1)	27
F(Prefer)	25.4(7.5)	12.2(3.6)	50
F(Depart)	26.2(7.7)	13.3(3.9)	51
Max Tim	68.8(20.2)	31.1(9.2)	45
Max PNV	43.8(12.9)	16.5(4.8)	38

LTSY and Growth at 2030

The goal of commercial timber lands is to achieve 90 percent of LTSY by 2030. This would not be achieved under any alternative due to the age structure of the Forest. Much of the Forest was burned by wildfire at the turn of the century. These stands, which contain most of the acreage of commercial timber land, are approaching or have just reached culmination of mean annual increment. Therefore, the overall growth of the Forest is very high now and will be for the next two decades. Growth then declines around 2030. For example, growth is calculated at 65 percent of LTSY at 1995 and then drops to 50 percent at 2030 under the Preferred Alternative (F). Thereafter growth increases under all alternatives as stands cut in the first few decades start increasing volume of growth. Most of the alternatives achieve 90 percent of LTSY around 2095, or after the Forest is almost regulated.

Additional actions required to achieve 90 percent of LTSY by 2030 for the Preferred Alternative (F) would be departing from the base harvest schedule. However, this would not increase the percentage very much, 51 percent as shown by F (Departure). Even the maximum timber benchmark does not achieve growth at 90 percent of LTSY at 2030 and it departs from nondeclining sustained yield. Even though large acreages of mature stands are harvested in the first few decades, these acres do not contribute large volumes of growth until after 2030. However, this benchmark achieves growth at 90 percent of LTSY at 2080, sooner than any of the other alternatives.

Comparison to Benchmark's

Under the minimum level benchmark, no timber sales would be programmed. Under the maximum PNV benchmark, 67.2 million board feet would be offered for sale annually in 2030.

RPA Recommended Program

The RPA Recommended Program is 41 million board feet (12.1 million cubic feet). Alternatives A-1 and A-2 meet the RPA Recommended Program. Alternatives B-1, B-2, and F meet 60 percent of the program, Alternatives C and D, 30 percent, and Alternatives E-1 and E-2, 80 percent.

SOILS	An estimated 2,000 acres are in need of restoration to control accelerated erosion. This erosion was caused by past resource management activities. Restoration is being done as funds are available.
Issues	- What measures are necessary to prevent or reduce erosion from: (a) road and trail maintenance; (b) off-road vehicle use; (c) timber sales; and (d) oil and gas exploration and development?
Current Plan	No new areas of management-caused erosion are expected because of the implementation of "best management practices."
All Alternatives	All restoration to control management-caused erosion would be completed by the year 2000.
RPA Recommended Program	Annual levels of soil resource improvement recommended by RPA range from 110 to 120 acres. This is within the needs and ability of the Forest. The exact acres in need of treatment will not be known until an inventory is completed.

MINERALS

Forest Service administration of mineral activities is in accordance with the 1872 Mining Law, the 1920 Mineral Leasing Act, the National Environmental Policy Act, and 36 CFR 252 (Code of Federal Regulations) and will be applied to all alternatives.

Issues

- How much mineral exploration and development should be allowed?

- How should conflicts between exploration for and development of mineral resources and surface resource values be resolved?

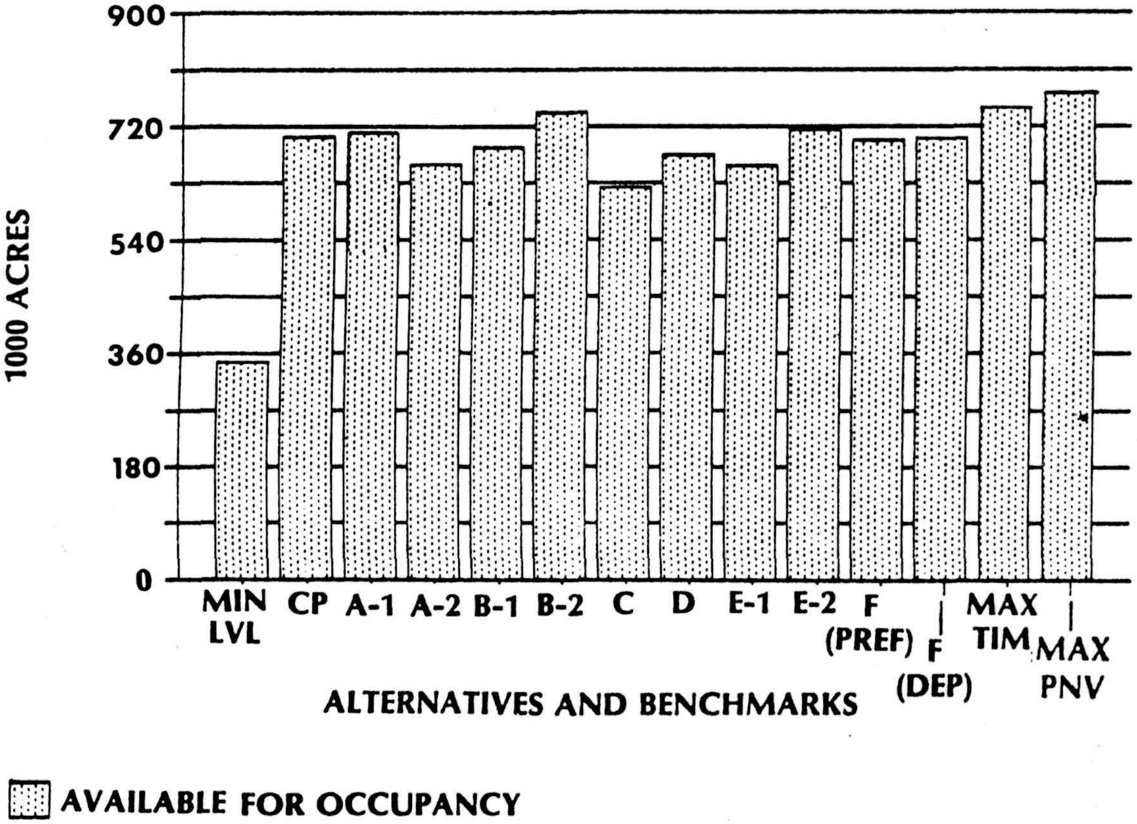
- How can the Forest help achieve the national need for energy self-sufficiency through conservation of renewable and nonrenewable energy resources?

Comparison

Figure 2.15 shows the lands available in any decade for occupancy for oil and gas leasing by alternative, mininum level benchmark, and maximum PNV benchmark. The different alternatives specify the degree of surface resource protection and access limitation.

FIGURE 2.15

LAND AVAILABLE FOR OIL & GAS OCCUPANCY LEASING



OIL AND GAS

Current Plan	Oil and gas leases are being processed under the guidelines in the "Environmental Assessment on Oil and Gas Leasing on Non-Wilderness Land." This assessment requires that occupancy leasing be recommended for accessible areas that can be adequately protected during oil and gas activity. Lease denial or issuance of a no-surface occupancy lease is recommended when an application is located entirely within an area that could not be adequately protected. Leases partially located in sensitive areas that cannot be protected receive a no-surface occupancy stipulation for those sensitive areas.
Alternative A	Leasing recommendations would be made using standard stipulations. A recommendation to deny leases would be made where physical limitations prevented occupancy.
Alternative B	Leasing recommendations would continue as under the current plan when additional applications are received. Occupancy leasing would be recommended for accessible areas which could be adequately protected during oil and gas activity. Lease denial or issuance of a no-surface occupancy lease would be recommended when an application is located entirely within an area which could not be adequately protected. Leases partially located in sensitive areas that could not be protected would receive a no-surface occupancy stipulation for those sensitive areas.
Alternative C,& D	In addition to the recommendations discussed under Alternative B, no-surface occupancy restrictions or limited surface use would be recommended on areas that would be managed for their semi-primitive recreation values.
Alternative E	Leasing recommendations would continue as under the current plan on the Rocky Mountain Division. On the Jefferson Division, only standard stipulations would be used to protect surface values.
Alternative F - Preferred	Leasing recommendations would continue as under the current plan when additional applications are received. Occupancy leasing would be recommended for accessible areas which could be adequately protected during oil and gas activity. Lease denial or issuance of a no-surface occupancy lease would be recommended when an application is located entirely within an area which could not be adequately protected. Leases partially located in sensitive areas that could not be protected would receive a no-surface occupancy stipulation for those sensitive areas.

All Alternatives

Conflicts between exploration and other resources are treated equally under all alternatives.

Only high value surface uses and improvements will be protected through mineral withdrawal.

METALLICS

Current Plan

A moderate level of exploration activity exists on the Forest. This includes geologic mapping, sampling, and a number of drilling projects carried out every year. Development work is taking place in the Barker-Hughsville area on patented claims and some development work is taking place on individual claims.

At present, the Forest receives approximately 12-15 operation plans per year, mostly from small operators. Although the number of plans would generally increase in the future, production would probably not increase significantly during the planning period. Production would generally come from established mining areas such as the Barker-Hughsville properties.

All Alternatives

Mineral development is governed by mining laws and regulations. Those alternatives which provide the most roads would provide the greatest opportunity for exploration of mineral resources.

Alternatives A-1, B-1, and E-1 would have the most road development. Alternatives A-2, B-2, and E-2 would have similar road development, but the Middle Fork Judith and Big Snowies would not be roaded. Alternative F would have moderate road development. Alternatives C and D have the least road development.

OIL AND GAS-METALLICS

Comparison to Benchmark's

Under the minimum level benchmark, the Forest would not make recommendation on oil and gas leases. Under the maximum PNV benchmark, the Forest would make recommendation as described under Alternative A. The Forest would continue to respond to operating plans under both benchmarks.

RPA Recommended Program

Because mineral activities are generated by the private sector, the Forest cannot fully manipulate levels of activity, although management practices may in fact influence these levels. Because of this, the Forest is not able to establish activity levels as it can with other Forest uses, but must make projections of anticipated activity instead. Based on activities in the summer of 1981, the RPA Recommended Program may be low.

WATER	Average annual water yield from National Forest land is estimated at 1,700,000 acre feet. An estimated 1,698,000 acre feet meet minimum standards according to state standards for "Best Management Practices."
Issues	- What coordination is necessary between water and other resources to protect watershed values and water quality?
Current Plan	Under current management direction, water meeting quality standards would increase to the average water production of 1,700,000 acre feet by the year 2000. RPA requires elimination of any existing activity-caused erosion by that time. Average water yield (all meeting minimum standards) would then continue at that level.
Alternative F - Preferred A, B, & E	Under these alternatives, there would be slight (up to 20,000 acre feet) increases in water production by 2030.
Alternative C, & D	Under these alternatives, current management would not change.
All Alternatives	Under all alternatives watershed values are protected.
RPA Recommended Program	Currently, the Forest slightly exceeds the RPA Recommended Program for water meeting water quality goals. All alternatives meet that program.

Human & Community Development & Lands

The Lewis and Clark National Forest is involved in two categories of Human Resource Programs, sponsored and hosted programs. Sponsored programs are those programs for which funding is appropriated by Congress and allocated either directly or indirectly to the Forest Service. Hosted programs include enrollees under other agencies and volunteers in National Forest.

The Blackfeet Indian Nation retains certain use rights on the northern part of the Rocky Mountain District. See Chapter III, page 3-3.

Management Concern

- How do rights accorded to the Blackfeet Indian Tribe in the agreement modified by Congress in 1896 affect management of National Forest land in that agreement?

All Alternatives

Forest Human Resource Programs would not change under any alternative.

The Forest will establish a working group with representation of the Blackfeet Tribe.

RPA Recommended Program

As long as funding is available, the Forest will meet the RPA Recommended Program in Human and Community Development.

LANDS

On the Lewis and Clark National Forest, the lands function is divided into five subparts: land adjustment, land uses, rights-of-way, land status, and land line location.

Management Concern

- What landownership adjustment would support resource management goals and when should the Forest place its priorities in an adjustment program?

All Alternatives

The size of the lands program is a direct reflection of the amount of resource activity proposed by each alternative. Under all alternatives the Forest will seek land ownership adjustments to support long-term Forest goals and objectives.

RPA Recommended Program

The RPA assignment will result from development of the Forest Plan. The Forest Plan shows the land adjustment and rights-of-way program under the Preferred Alternative.

FACILITIES - ROADS AND TRAILS

The current inventoried road system on the Forest consists of 155 miles of arterial roads, 643 miles of collector roads, and 597 miles of local roads. There are an estimated 600 miles of primitive roads which are not on the inventory. The current trails system on the Forest consist of 1,677 miles.

Issues

- What is adequate access to and within the National Forest?

- What roads should be maintained and to what extent?

Comparison

Additional road needs for alternatives, the minimum level benchmark, and the maximum PNV benchmark are shown on Figures 2.16 and 2.17. All figures are for roads needed for surface resource management. Additional roads could be constructed for subsurface uses.

FIGURE 2.16

ARTERIAL AND COLLECTOR ROADS

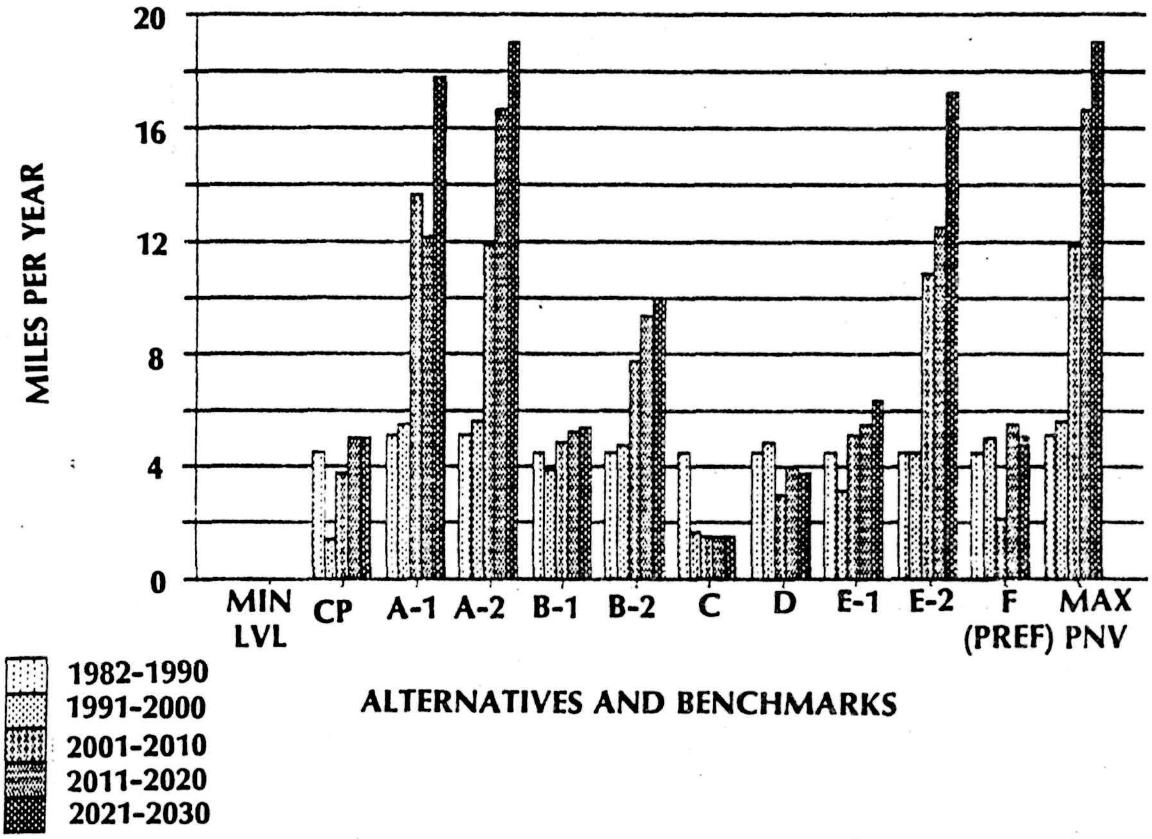
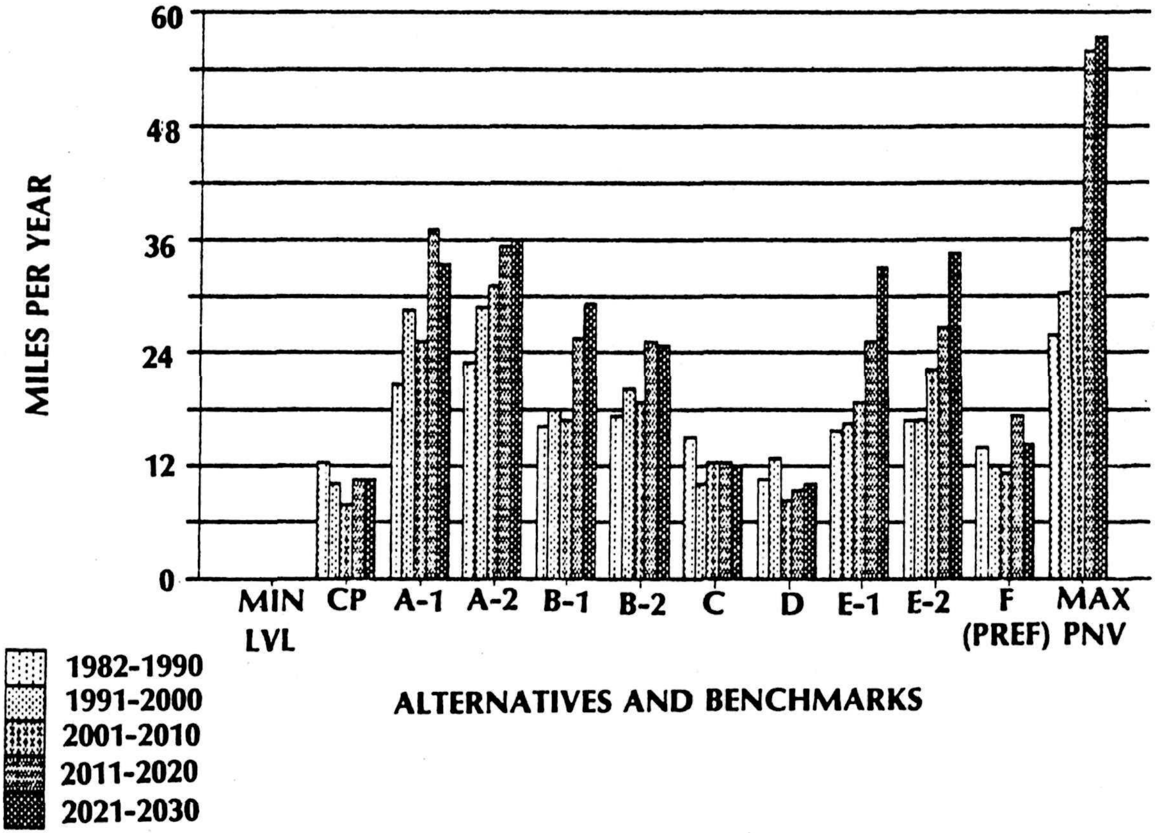


FIGURE 2.17
LOCAL ROADS



Current Plan

Under the current management plan, by 2030 an additional 615 miles of arterial and collector roads and 523 miles of timber support local roads would be constructed. About 99 miles of rights-of-way across private land would be required. The amount of trails would decrease as presently unroaded areas become roaded. No new trails are planned.

Alternative A-1

Under this alternative, by 2030 an additional 514 miles of arterial and collector roads and 1,466 miles of timber support local roads would be constructed. About 199 miles of rights-of-way across private land would be required. Most trails would be replaced with roads. About 20 miles of trails would be constructed or reconstructed per decade. These trails would generally be in classified wilderness.

Alternative A-2

Under this alternative, by 2030 an additional 559 miles of arterial and collector roads and 1,584 miles of timber support local roads would be constructed. About 199 miles of rights-of-way across private lands would be required. Most trails would be replaced with roads. About 15 miles of trails would be constructed or reconstructed per decade. These trails would generally be in classified wilderness.

Alternative B-1

Under this alternative, by 2030 an additional 210 miles of arterial and collector roads and 1,064 miles of timber support local roads would be constructed. About 183 miles of rights-of-way across private land would be required. Many trails would be replaced by roads. About 8 miles of trails would be constructed or reconstructed annually. These trails would generally be in classified wilderness.

Alternative B-2

Under this alternative, by 2030 an additional 338 miles of arterial and collector roads and 1,075 miles of timber support local roads would be constructed. About 183 miles of rights-of-way across private land would be required. Many trails would be replaced by roads. No trails would be constructed or reconstructed.

Alternative C

Under this alternative, by 2030 an additional 72 miles of arterial and collector roads and 627 miles of timber support local raods would be constructed. About 168 miles of rights-of-way across private land would be required. Some trails would be replaced by roads. About 20 miles of trails would be constructed per decade. These trails would be in undeveloped lands and classified wilderness.

Alternative D

Under this alternative, by 2030 an additional 210 miles of arterial and collector roads and 520 miles of timber support local roads would be constructed. About 148 miles of rights-of-way across private land would be required. About 20 miles of trails would be constructed or reconstructed per decade. These trails would be in undeveloped lands and classified wilderness.

Alternative E-1

Under this alternative, by 2030 an additional 219 miles of arterial and collector roads and 1,100 miles of timber support local roads would be constructed in the Jefferson Division. About 169 miles of rights-of-way across private land would be required. Most trails in the Jefferson Division would be replaced by roads. About 20 miles of trails would be constructed or reconstructed per decade. Most of these trails would be in classified wilderness and other areas of the Rocky Mountain Division.

Alternative E-2

Under this alternative, by 2030 an additional 477 miles of arterial and collector roads and 1,181 miles of timber support local roads would be constructed on the Jefferson Division. About 169 miles of rights-of-way across private land would be required. Most trails in the Jefferson Division would be replaced by roads. About 18 miles of trails would be constructed or reconstructed per decade. These trails would be in the Rocky Mountain Division.

Alternative F - Preferred

Under this alternative, by 2030 an additional 221 miles of arterial and collector roads and 698 miles of timber support local roads would be constructed. About 70 miles of rights-of-way across private land would be required. Some trails would be replaced by roads. About 20 miles of trail would be constructed or reconstructed per decade. These trails would be in undeveloped lands and classified wilderness.

All Alternatives

Road management practices are the same for all alternatives. Road closures and/or restrictions are used to provide public safety, protect resource values, and reduce user conflicts. One of the major objectives of road management is to provide security areas for wildlife. Road maintenance and road signing are governed by the road standard, use level, and condition of the road.

RPA Recommended Program

Under Alternative A, which meets the RPA recommended program for timber, 5 to 8 miles per year of arterial-collector roads and 19 miles per year of timber supported local roads would be constructed. This would increase to 81 miles of local roads per year in the last decade. No RPA assignment exists for trails. Information from the planning process will be used in the 1985 RPA update.

PROTECTION - FIRE MANAGEMENT

The Forest is currently operating under a 1972 Fire Plan. However, funding has not been sufficient to fully implement this plan.

Issues

- How much, if any, prescribed burning should be planned?

Comparison

Table 2.8 displays acres of prescribed fire and active fuel treatment for the alternatives.

TABLE 2.8 **FIRE ACREAGES**

Alternative	Prescribed Fires w/Planned Ignitions (Acre/Year)	Prescribed Fires w/Unplanned Ignitions (Acre/Year)	Activity Fuel Treatment (Acre/Year)
Current Plan	1931	3138	1393
A-1	4128	4753	3143
A-2	4932	3431	3294
B-1	2368	4753	2367
B-2	2398	3431	2382
C	3318	4753	1497
D	2920	4712	1300
E-1	3788	4753	2503
E-2	3570	3431	2672
F	3036	3431	2230

Current Plan

A Level I Fire Analysis describing the Current Management fire situation for both suppression and fire use was recently completed for the Forest. A Fire Management Plan for the Scapegoat Wilderness/ Danaher portion of the Bob Marshall Wilderness was approved in July, 1981. A Fire Management Plan for the remainder of the Bob Marshall Wilderness is scheduled to be completed by 1985.

All Alternatives

With all alternatives, activity debris disposal and prescribed fire for resource improvement would not make a significant reduction in the projected wildfire burned acreage. Acres burned may be reduced by breaking up continuous decadent lodgepole pine through timber harvest and subsequent debris disposal in the Jefferson Division, but the amount of reduction is not quantifiable.

Obviously, those alternatives that provide for the most activity fuel disposal in the Little Belts and prescribed fire for resource improvement would have the greatest chance of reducing acreage burned by wildfire.

Comparison to Benchmark's

Under the minimum level benchmark, no activity fuel treatment or resource improvement burning would be accomplished.

PROTECTION - LAW ENFORCEMENT

Current Plan

The Forest relies on cooperative law enforcement agreements with counties to provide much of its law enforcement needs. Currently, the Forest has 11 cooperative agreements.

All Alternatives

The Forest approach to law enforcement would not change under any alternative.

PROTECTION - INSECT AND DISEASE

Nine insects and twenty diseases have been identified as major damaging agents of the trees of the Lewis and Clark National Forest.

The mountain pine beetle presents the most serious threat to lodgepole pine. Beetle populations periodically increase and kill most large diameter trees in a forest before subsiding. The Forest has about 250,000 acres which is highly susceptible to mountain pine beetle attacks (over 90 years old).

Mountain pine beetle has infested about 10,000 acres of ponderosa pine mainly on the Judith Ranger District. Western spruce budworm has caused defoliation of nearly 35,000 acres of Douglas fir. Dwarf mistletoe infestations in lodgepole pine occur in 36.6 percent of the commercial lodgepole pine type on the Forest. Root disease occurs extensively in Douglas fir and lodgepole pine.

Issues

- To what extent and in what manner should insect and disease control be carried out?

All Alternatives

Under Alternative A-2, 50 percent of the scheduled timber harvest would be in lodgepole pine stands. This would amount to 20 million board feet by the 5th decade. Under Alternative F (Preferred), 70 percent of the scheduled timber harvest would be in the lodgepole pine stands by the 2nd decade. Alternative F places the most emphasis on the removal of high risk lodgepole pine stands. Other alternatives also emphasize the removal of stands that exhibit characteristics of high risk for mountain pine beetle attack.

QUANTITATIVE ECONOMIC COMPARISON

Management Concern

- Consider the needs to provide goods and services efficiently.

Benefits

Benefit values were assigned to market outputs and selected nonmarket outputs. Dollar values were assigned to benefits from timber, range, recreation, and oil and gas leasing. These values are discussed under costs and benefits in the Alternative Formulation portion of this chapter.

Return to U.S. Government

For FY 1981, the Lewis and Clark National Forest generated $830,000 which is returned to the U.S. Treasury. This is the revenue the Forest collects from timber sales, grazing fees, timber purchasers road credits, sale area betterment collections, recreation fees, mineral leasing, and land use charges.

Return to State

By Federal law, 25 percent of this revenue is returned to the State for use by the counties for schools and roads. Counties' shares of the payment are determined by the acreage of National Forest within the county. In addition, counties receive PILT (payment in-lieu of taxes). PILT ranges from 10 cents to 75 cents per acre.

Costs

Forest Service costs are estimated for each alternative. In FY 1981, the Forest had a budget of $4.1 million. Of this total, $3.1 million was for the protection and utilization of the Forest, $.9 million was for construction and land acquisition, and $.1 million was funds collected for slash disposal, reforestation, timber stand improvement, and other work.

Capital Investment, Purchaser Road Credits, Permittee Costs

Capital investment includes costs for arterial and collector road construction and campground construction by the Forest Service. Timber purchaser road credits are credits given to timber sale purchasers for the construction of system roads. Permittee costs are the costs the Forest shares with a range permittee for the construction of range improvements, such as fences and water improvements.

Table 2.9 displays the benefits and costs of the alternatives studied in detail and several benchmarks.

TABLE 2.9

ANNUAL BENEFITS AND COSTS
MILLION DOLLARS

DECADE	Min Level	Current Plan	A-1	A-2	B-1	B-2	C
1982-1990							
Total Benefits	63.30	112.62	139.63	142.53	120.52	120.19	112.60
Returns to U.S. Govt.	.40	.83	.99	.99	.86	.86	.82
Returns to State	.10	.21	.25	.25	.22	.22	.21
Total Costs	2.71	3.88	4.69	4.82	4.11	4.15	4.29
Capital Investment	.00	.20	.30	.31	.20	.20	.20
Operations, Mtnce.	2.71	3.68	4.39	4.51	3.91	3.95	4.09
Purchaser Road Credits	.00	.44	.59	.69	.46	.51	.44
Permittee Cost	.00	.09	.09	.09	.09	.09	.09
1991-2000							
Total Benefits	71.66	132.90	230.06	224.97	174.29	175.22	133.19
Returns to U.S. Govt.	.40	.90	1.40	1.40	1.06	1.05	.89
Returns to State	.10	.23	.35	.35	.27	.26	.22
Total Costs	2.64	3.69	5.24	5.29	4.22	4.32	4.09
Capital Investment	.00	.07	.53	.54	.26	.29	.11
Operations, Mtnce.	2.64	3.62	4.71	4.75	3.96	4.03	3.98
Purchaser Road Credits	.00	.35	.97	.97	.60	.73	.36
Permittee Cost	.00	.09	.09	.09	.09	.09	.08
2001-2010							
Total Benefits	80.03	150.34	273.15	308.03	211.07	232.60	150.84
Returns to U.S. Govt.	.40	.96	1.68	1.68	1.21	1.21	.95
Returns to State	.10	.24	.42	.42	.30	.30	.24
Total Costs	2.64	3.84	6.40	6.26	4.32	4.51	3.96
Capital Investment	.00	.25	1.19	1.07	.30	.50	.10
Operations, Mtnce.	2.64	3.59	5.21	5.19	4.02	4.01	3.86
Purchaser Road Credits	.00	.33	1.44	1.44	.70	.98	.31
Permittee Cost	.00	.09	.10	.10	.09	.09	.08
2011-2020							
Total Benefits	88.44	177.21	367.66	367.11	270.27	264.91	180.22
Returns to U.S. Govt.	.40	1.02	1.94	1.94	1.35	1.35	1.00
Returns to State	.10	.26	.49	.49	.34	.34	.25
Total Costs	2.64	4.03	6.81	7.29	4.88	5.14	4.19
Capital Investment	.00	.34	1.34	1.49	.36	.62	.12
Operations, Mtnce.	2.64	3.69	5.47	5.80	4.57	4.52	4.07
Purchaser Road Credits	.00	.47	1.42	1.46	1.15	1.13	.59
Permittee Cost	.00	.09	.10	.10	.09	.09	.08
2021-2030							
Total Benefits	97.08	193.82	410.69	437.80	313.68	314.77	196.51
Returns to U.S. Govt	.40	1.07	2.27	2.27	1.53	1.53	1.05
Returns to State	.10	.27	.57	.57	.38	.38	.26
Total Costs	2.64	4.03	8.13	7.42	4.97	5.24	4.16
Capital Investment	.00	.34	1.64	1.60	.40	.64	.13
Operations, Mtnce.	2.64	3.69	6.49	5.82	4.57	4.60	4.03
Purchaser Road Credits	.00	.49	2.57	2.02	1.36	1.20	.57
Permittee Cost	.00	.09	.10	.10	.10	.10	.08

TABLE 2.9

ANNUAL BENEFITS AND COSTS
MILLION DOLLARS

DECADE	D	E-1	E-2	F (Prefer)	F (Depart)	MAX TIMBER	MAX PNV
1982-1990							
Total Benefits	116.32	120.02	119.82	128.86	130.09	158.25	158.73
Returns to U.S. Govt.	.82	.83	.83	.83	.95	1.01	1.00
Returns to State	.21	.21	.21	.21	.24	.25	.25
Total Costs	3.97	4.05	4.07	4.31	4.63	4.70	4.49
Capital Investment	.20	.20	.20	.20	.30	.60	.60
Operations, Mtnce.	3.77	3.85	3.87	4.11	4.33	4.10	3.89
Purchaser Road Credits	.49	.45	.48	.57	.75	1.02	.71
Permittee Cost	.09	.09	.09	.09	.09	.03	.03
1991-2000							
Total Benefits	133.09	167.89	164.93	164.17	175.42	222.89	223.19
Returns to U.S. Govt.	.89	1.02	1.02	1.02	1.21	1.37	1.35
Returns to State	.22	.26	.26	.26	.30	.34	.34
Total Costs	4.03	4.10	4.19	4.56	5.28	5.14	5.00
Capital Investment	.46	.23	.32	.35	.50	1.00	1.00
Operations, Mtnce.	3.57	3.87	3.87	4.21	4.78	4.14	4.00
Purchaser Road Credits	.35	.56	.58	.58	1.38	1.37	1.02
Permittee Cost	.09	.09	.09	.09	.09	.03	.03
2001-2010							
Total Benefits	155.85	224.37	251.79	206.78	236.66	278.96	323.52
Returns to U.S. Govt.	.97	1.24	1.24	1.21	1.59	1.81	1.80
Returns to State	.24	.31	.31	.30	.40	.45	.45
Total Costs	4.12	4.61	5.16	4.81	5.73	6.55	6.07
Capital Investment	.51	.47	.85	.41	.80	1.50	1.50
Operations, Mtnce.	3.61	4.14	4.31	4.40	4.93	5.05	4.57
Purchaser Road Credits	.29	.72	1.12	.68	1.58	4.02	1.59
Permittee Cost	.10	.09	.09	.09	.09	.04	.04
2011-2020							
Total Benefits	181.39	305.64	301.26	263.70	290.45	460.90	479.81
Returns to U.S. Govt.	1.03	1.48	1.48	1.40	1.78	2.42	2.42
Returns to State	.26	.37	.37	.35	.45	.61	.61
Total Costs	4.62	5.12	5.50	5.51	6.11	7.26	7.11
Capital Investment	.74	.39	.89	.74	.85	2.00	2.00
Operations, Mtnce.	3.88	4.73	4.61	4.77	5.26	5.26	5.11
Purchaser Road Credits	.57	.97	1.05	.81	.81	2.23	2.41
Permittee Cost	.10	.10	.10	.09	.09	.04	.04
2021-2030							
Total Benefits	199.44	383.78	396.40	309.44	298.11	608.20	644.77
Returns to U.S. Govt.	1.08	1.92	1.95	1.54	1.83	3.52	3.52
Returns to State	.27	.48	.49	.39	.46	.88	.88
Total Costs	4.55	5.62	6.49	5.41	6.20	9.60	8.62
Capital Investment	.77	.49	1.22	.63	1.00	2.50	2.50
Operations, Mtnce.	3.78	5.13	5.27	4.78	5.20	7.10	6.12
Purchaser Road Credits	.55	1.62	1.60	1.37	1.24	4.75	3.70
Permittee Cost	.10	.10	.10	.09	.09	.04	.04

FIGURE 2.18

PRESENT VALUE BENEFIT

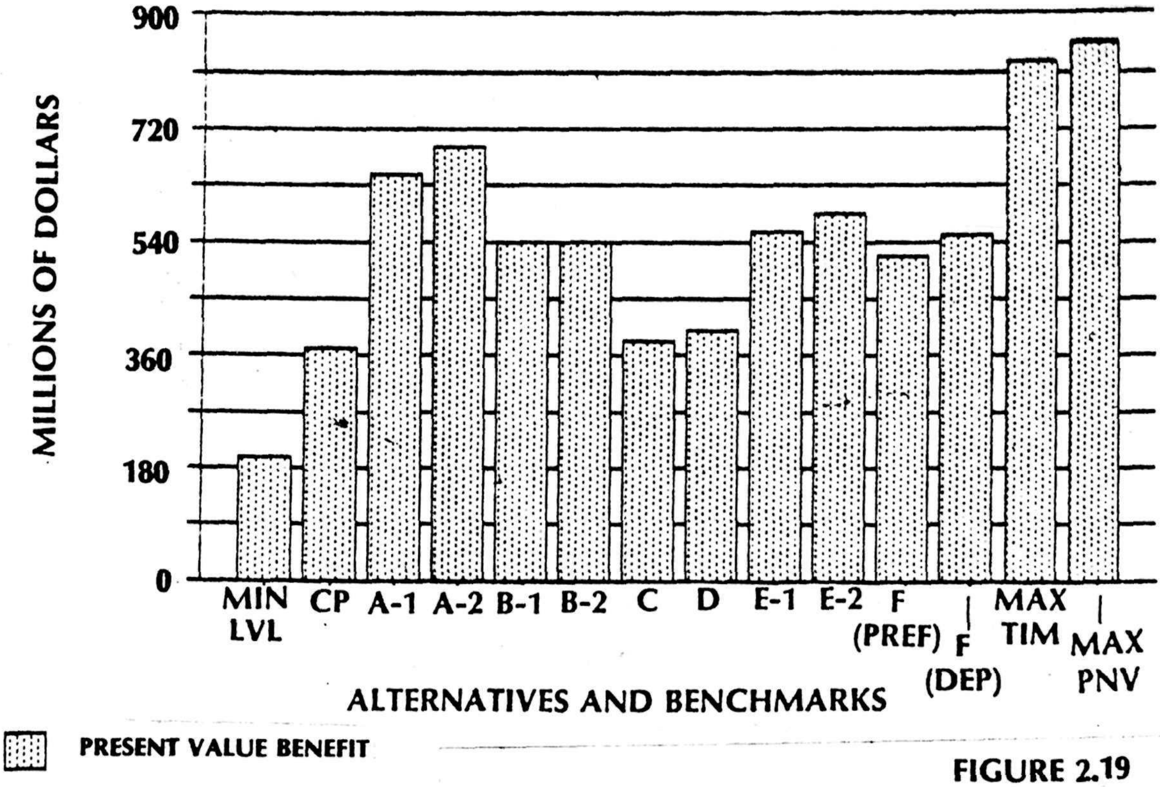
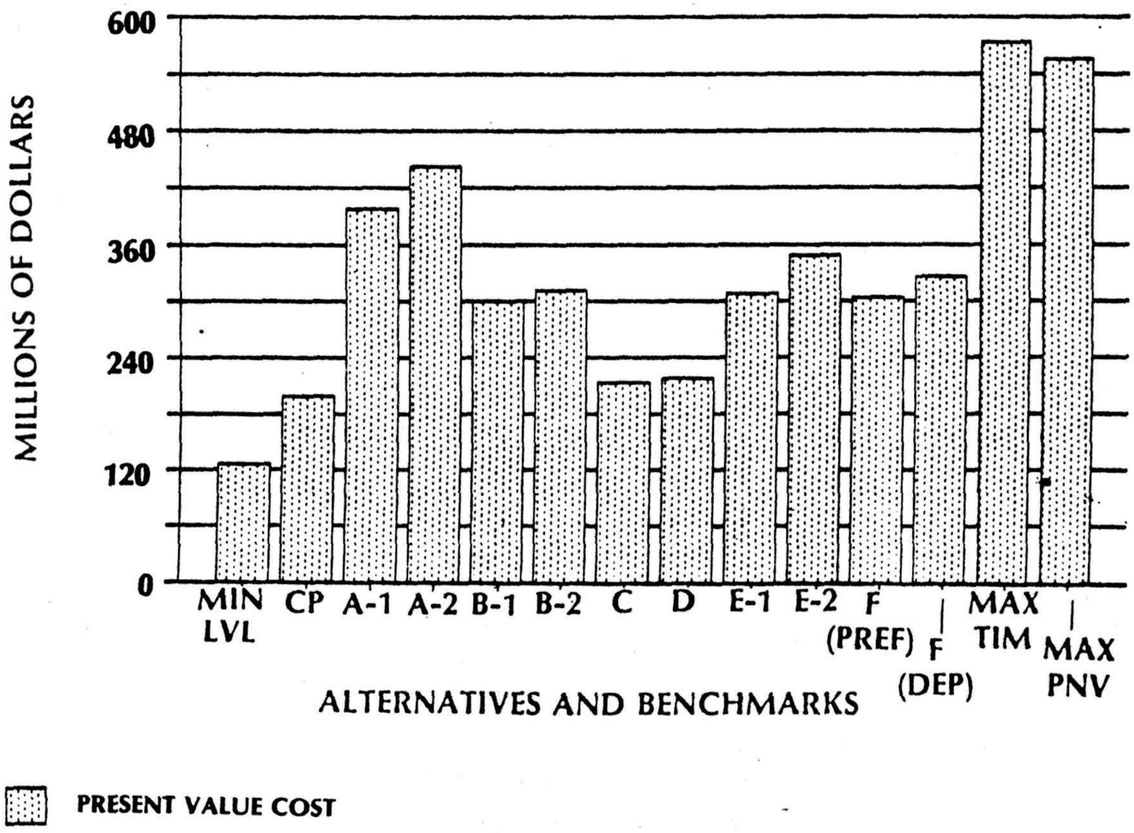


FIGURE 2.19

PRESENT VALUE COST



Present Value, Benefits and Costs

Present value benefits and costs are the total discounted benefits and costs. Figures 2.18 and 2.19 display a comparison of these numbers.

PRESENT NET VALUE OPPORTUNITY COSTS

PNV (present net value) and opportunity cost are economic evaluation tools useful in examining the economic differences between alternatives. PNV is the discounted benefit less discounted costs associated with providing all resource outputs to which monetary value can be assigned, including both market and selected non-market outputs. Opportunity cost is the difference between the PNV of each alternative and the highest alternative investment opportunity (in this case the Max PNV benchmark). Table 2.10 displays both PNV and opportunity cost for each alternative and benchmark.

The allocation and scheduling of acres in management prescriptions for each alternative was done by maximizing PNV in FORPLAN. This satisfied NFMA regulations which require each alternative represent the "most efficient combination of management practices examined that can meet the objectives established in the alternatives."

TABLE 2.10 PRESENT VALUE BENEFITS AND COSTS, PRESENT NET VALUE, AND OPPORTUNITY COSTS
(Million Dollars)

(All values calculated at 4% discount rates unless otherwise indicated)

	Min Level	Current Plan	A-1	A-2	B-1	B-2	C
Present Value Benefit	198.49	374.81	651.23	694.24	544.41	544.43	387.38
Present Value Returns to U.S. Government	10.00	23.50	38.90	38.90	28.80	28.80	23.20
Present Value Benefits Excluding Returns to U.S. Government	188.49	351.31	612.33	655.34	515.61	515.63	364.18
Present Value Costs	77.31	199.68	400.94	446.10	301.82	315.10	214.90
Present Net Value	121.18	175.19	250.29	248.12	242.61	229.33	174.48
Present Net Value at 7-1/8%	58.38	75.00	102.60	103.06	100.47	94.17	77.50
PNV Change from Minimum Level	.00	54.01	129.11	126.94	121.43	108.15	53.30
Opportunity Cost	180.96	126.95	51.85	54.02	59.53	72.81	127.66
Benefit-Cost Ratio	2.57	1.88	1.62	1.56	1.80	1.73	1.80

	D	E-1	E-2	F (Prefer)	F (Depart)	MAX TIM	MAX PNV
Present Value Benefit	400.16	559.79	587.62	522.69	553.56	834.44	860.31
Present Value Returns to U.S. Government	23.40	31.00	31.10	28.50	34.50	46.90	46.40
Present Value Benefit Excluding Returns to U.S. Government	376.76	528.79	556.52	494.19	519.06	787.54	813.91
Present Value Costs	219.77	311.69	350.92	305.41	329.78	577.60	558.17
Present Net Value	180.39	248.10	236.70	217.28	223.78	256.84	302.14
Present Net Value at 7-1/8%	73.91	100.69	96.17	92.14	94.81	92.92	113.85
PNV Change From Minimum Level	59.21	126.92	115.52	96.10	102.60	135.66	180.96
Opportunity Cost	121.75	54.04	65.44	84.86	78.36	45.30	.00
Benefit-Cost Ratio	1.82	1.80	1.67	1.71	1.68	1.44	1.54

FIGURE 2.20
PRESENT NET VALUE

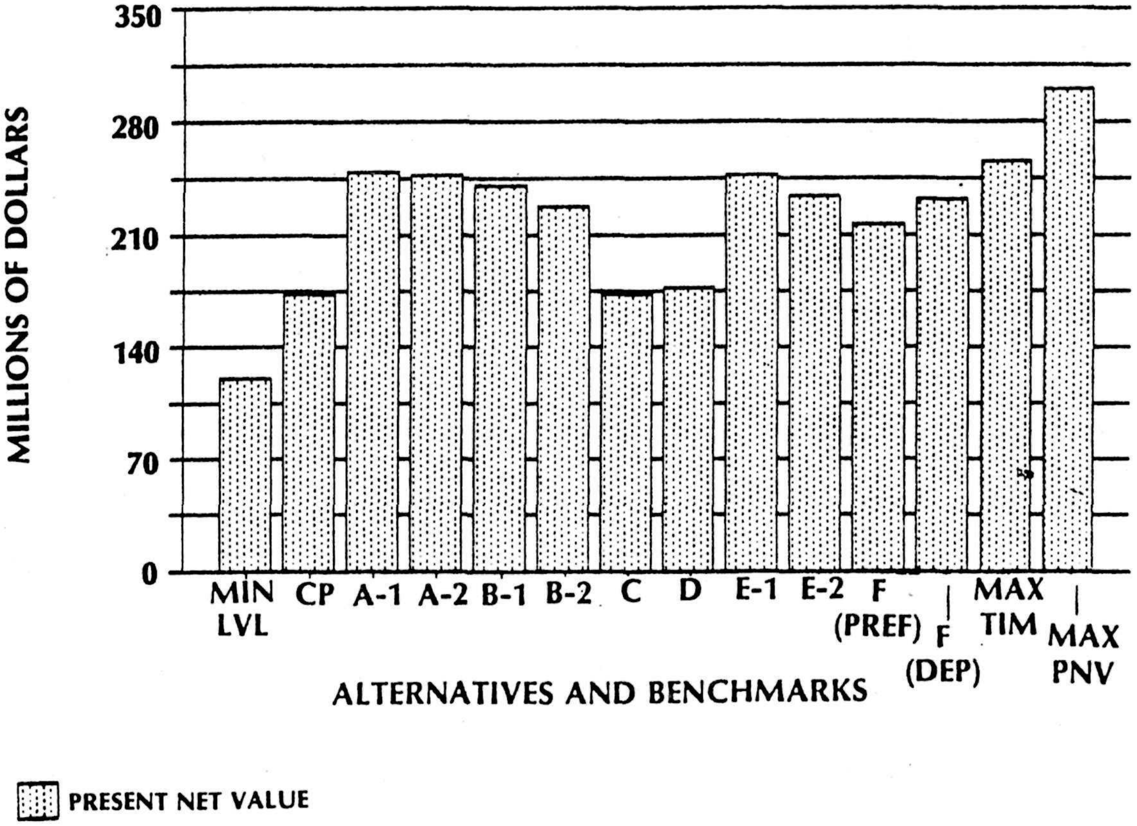
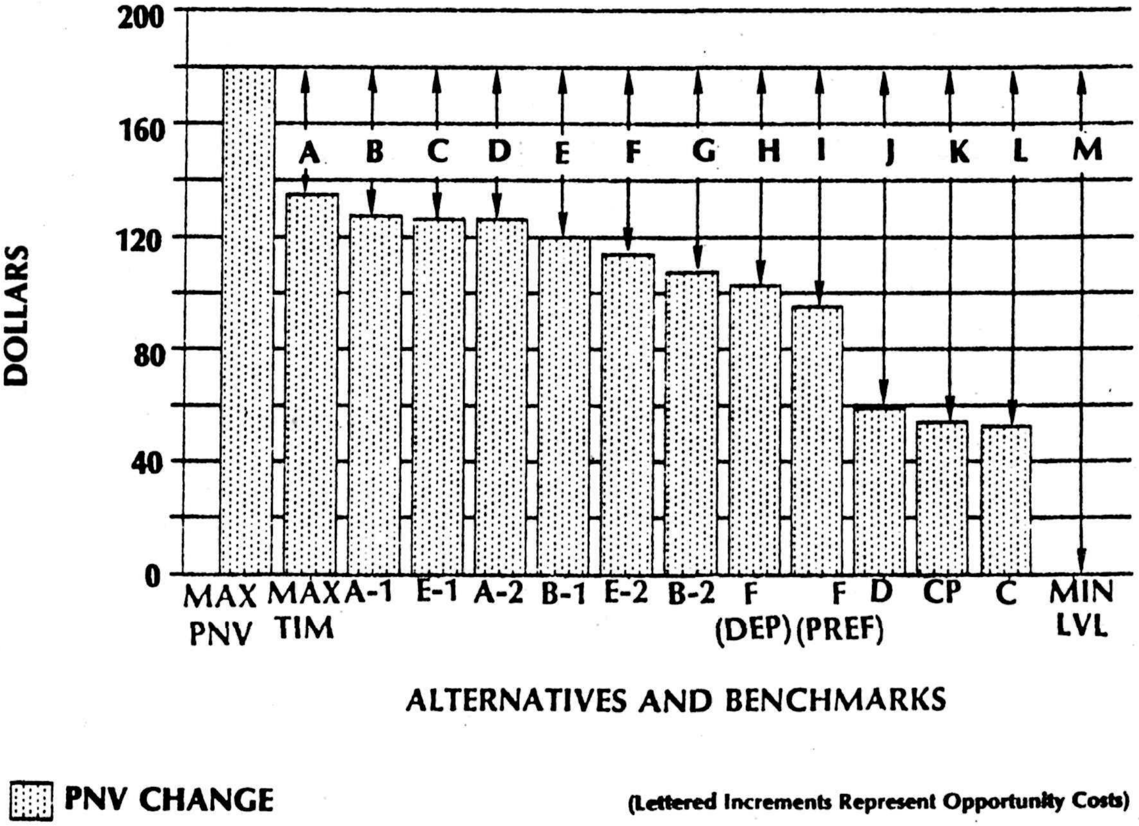


Figure 2.20 shows the total present net value for all alternatives and several benchmarks. Figure 2.21, on the next page, shows the PNV component of each benchmark and alternative above the minimum level benchmark PNV level. The increments (A, B, C, etc.) displayed are the opportunity costs of each benchmark and alternative. The maximum PNV benchmark has a zero opportunity cost since it has the highest legally attainable PNV.

FIGURE 2.21

PNV CHANGES FROM MINIMUM LEVEL



(Lettered Increments Represent Opportunity Costs)

The following discussion describes the opportunity cost increments presented in Figure 2.21. Opportunity costs represent the increments of PNV given up as output levels change from the maximum PNV benchmark. These different output levels required the application of a unique set of constraints to the FORPLAN model. Thus, opportunity cost can be described by these constraints and the output levels associated with them.

Land management must be based on sound environmental principles as well as on cost and benefit criteria for allocating and scheduling all of the possible management prescriptions on a given piece of land. An alternative may have the least opportunity cost of any alternative or be the most economically efficient in terms of the selected costs and benefits. However, the opportunity costs discussed here are not the only criteria used in evaluating Forest Plan alternatives. The interdisciplinary team takes into account other physical, biological, social, and economic variables in evaluating which alternative will best maximize net public benefits (see the Net Public Benefit discussion following this section).

Only under the wilderness allocation can exact changes in opportunity cost be determined. Alternatives A, B, and E consider MWSA areas with and without wilderness designation. Because all other constraints were the same for these alternatives, the wilderness contribution to opportunity cost could be determined exactly.

The combined effect of different output levels and constraints used on each alternative caused alternatives to have varying opportunity costs. The reasons for these opportunity costs varying are listed in the following discussion.

Increment A (Corresponds to Maximum Timber Benchmark)

Because the set of constraints used on the maximum timber benchmark were the same as those on maximum PNV, the reduction in PNV ($45 million) can be attributed to maximizing timber rather than maximizing PNV. Maximizing timber without regard to cost decreased PNV because some lands that were not economical were scheduled for timber harvest. This harvesting accounts for all the opportunity cost.

Constraints Which Affected All Alternatives Studied in Detail

Some of the decreases in PNV associated with the remaining increments can be attributed to the set of constraints used on grazing and timber harvesting. These constraints are described below.

Grazing

The optimal level for grazing indicated by the maximum PNV benchmark is around 30,000 AUMs. Any allocation above this level increases the opportunity cost. All alternatives studied in detail allocate at least 70,000 AUMs to grazing. Constraints which control the amount of grazing by mountain ranges and in riparian zones also increase opportunity cost slightly.

Timber

Because the maximum PNV benchmark harvests timber at the same rate for the first five decades as the maximum timber benchmark, any deviation from that schedule or allocation would lower the PNV and thus increase the opportunity cost. Several factors involving the timber resource cause a high opportunity cost for an alternative. These factors, in order of magnitude of increases to opportunity cost, are:

Harvest level - Any alternative with a harvest level below the maximum PNV has an increase in opportunity cost.*

NDSY (Nondeclining Sustained Yield) - A NDSY constraint, where the timber harvest in a decade is greater than or equal to the timber harvest in the previous decade, causes an increase in opportunity cost. All alternatives studied in detail have this constraint.

Scheduling - Although the rate of access for timber harvested is controlled in the maximum PNV benchmark, scheduling of areas to be harvested is not controlled. Proper scheduling ensures community stability. For example, the Little Belt Mountains may account for the total timber harvest for the first 2 decades. Then in the following decade, the total timber harvest may switch to other mountain ranges such as the Crazies or Snowies while no timber would be harvested in the Little Belts. Timber dependent communities located near the Little Belt Mountains, such as White Sulphur Springs, could not withstand such fluctuations in the timber supply. All alternatives studied in detail include spatial constraints which schedule timber harvest realistically. Thus, these alternatives have increased opportunity costs.

Harvesting on the Rocky Mountain Division during the first 5 decades, which is required by all alternatives except E, contributes to a high opportunity cost. Under the maximum PNV benchmark, harvesting on the Rocky Mountain Division does not start until the fifth decade. Hauling distances are longer on the Rocky Mountain Division than the Jefferson Division; thus, harvesting, is more cost-efficient on the Jefferson Division.

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*The allocation of lands to timber harvesting is sensitive to the market price for timber. When the analysis for this EIS was started, the most recent data indicated that the average price for timber was $42 per thousand board feet. Recently, the average price has been $27 per thousand board feet. An analysis using the most recent price would probably result in a lower level of timber harvest for the maximum PNV benchmark.

Visual Quality Objectives - Constraints which ensure a certain visual quality objective, such as partial retention, increase the cost of harvesting in some areas slightly. All alternatives studied in detail contain such constraints. The degree to which opportunity cost is influenced by visual quality constraints varies with the level of timber harvest; the greater the timber harvest, the higher the opportunity cost. In any case, the opportunity cost, due to meeting visual quality objectives, is not as high as the previous mentioned factors.

Five Year Plan - Constraining an alternative to allocate and schedule areas to a specific area for harvesting, such as required by the five year plan, increases opportunity cost slightly. All alternatives studied in detail contain the five year plan.

Increment B (Corresponds to Alternative A-1)

Alternative A-1 has an opportunity cost of $52 million. In addition to decreases in PNV attributed to the set of constraints mentioned above, PNV was decreased further by constraining Alternative A-1 to require certain amounts of acre equivalents and AUMs for wildlife habitat. This decrease would be expected because no direct wildlife values were included in the maximum PNV benchmark.

Increment C (Corresponds to Alternative E-1)

The decrease in PNV associated with Alternative E-1 ($54 million) is caused by the same basic set of constraints used for Alternative A-1. These two alternatives have nearly identical opportunity costs. Although timber harvest is lower in Alternative E-1, which should reduce PNV, it is accomplished in a more cost-efficient manner than in Alternative A-1 because no harvest is required on the Rocky Mountain Division.

Increment D (Corresponds to Alternative A-2)

Alternative A-2 has a $2 million decrease in PNV for Alternative A-1. This decrease can be attributed to MWSA areas not being classified as wilderness. High recreation values for wilderness recreation account for Alternative A-1 having a higher PNV than Alternative A-2. Outputs for other resources can still be met when MWSA areas are classified as wilderness.

Increment E (Correpsonds to Alternative B-1)

Alternative E-1 had an opportunity cost of $60 million. It had the same constraints as Alternative A-1 but the output levels were set at a lower level than Alternative A-1. Lowering the amount of timber harvested decreased PNV the most of any of the outputs lowered. PNV did increase slightly due to having less range output and wildlife improvement.

Increment F (Corresponds to Alternative E-2)

Alternative E-2 has a $12 million decrease in PNV from Alternative E-1. This decrease is directly attributed to not having MWSA areas classified as wilderness. All other outputs were the same.

Increment G (Corresponds to Alternative B-2)

Alternative B-2 has a $13 million decrease in PNV from Alternative B-1. Again, this decrease is directly attributed to not having MWSA areas classified as wilderness. All other outputs were the same.

Increment H (Corresponds to Alternative F - Depart)

Alternative F (Depart) had an opportunity cost of $78 million. It had a lower PNV than other alternatives due to retaining areas of high public interest in a semi-primitive recreation setting. By removing the NDSY constraint, the PNV increased slightly but not enough to offset the effect the special constraints had in requiring preservation of semi-primitive recreation areas. Constraints which affected all alternatives studied in detail applied to this alternative.

Increment I (Corresponds to Alternative F - Preferred)

Alternative F (Preferred) has a lower PNV than the alternatives for the same reasons as mentioned in Increment H. However, Alternative F (Preferred) did have the NDSY constraint. This accounted for a decrease of $7 million in PNV from Alternative F (Departure).

Increment J (Corresponds to Alternative D)

Alternative D had an opportunity cost of $122 million. It had a low PNV due to having a low level of timber harvest, a high level of grazing, and requiring some areas to remain in a semi-primitive recreation setting.

Increment K (Corresponds to Current Plan)

Current Plan has an opportunity cost of $127 million. It has a low PNV due to a low level of timber harvest. Constraints that affect all alternatives studied in detail affect Current Plan.

Increment L. (Corresponds to Alternative C)

Alternative C had the highest opportunity cost of all the alternatives studied in detail ($128 million). A low timber harvest level, a high level of wildlife habitat improvement, and not scheduling development for all semi-primitive recreation areas of high public interest decreased PNV.

Increment M (Corresponds to Minimum Level)

This benchmark has the highest opportunity cost of $181 million. This is primarily due to the sudden phase out of most commodity outputs with only limited Forest Service presence to manage the Forest in a custodial manner.

EMPLOYMENT AND INCOME

Figures 2.22 and 2.23 display employment and income changes for the alternatives for the 1st and 5th decades. They were based on changes in timber harvest and grazing levels. Projections were made with an input/output model. The input/output model is described in the planning record, "Input/Output Model."

Oil and gas exploration and development would cause the same changes in employment and income under all alternatives. The magnitude and effects of these changes are discussed in Chapter 4.

FIGURE 2.22
EMPLOYMENT CHANGES
FROM CURRENT PLAN

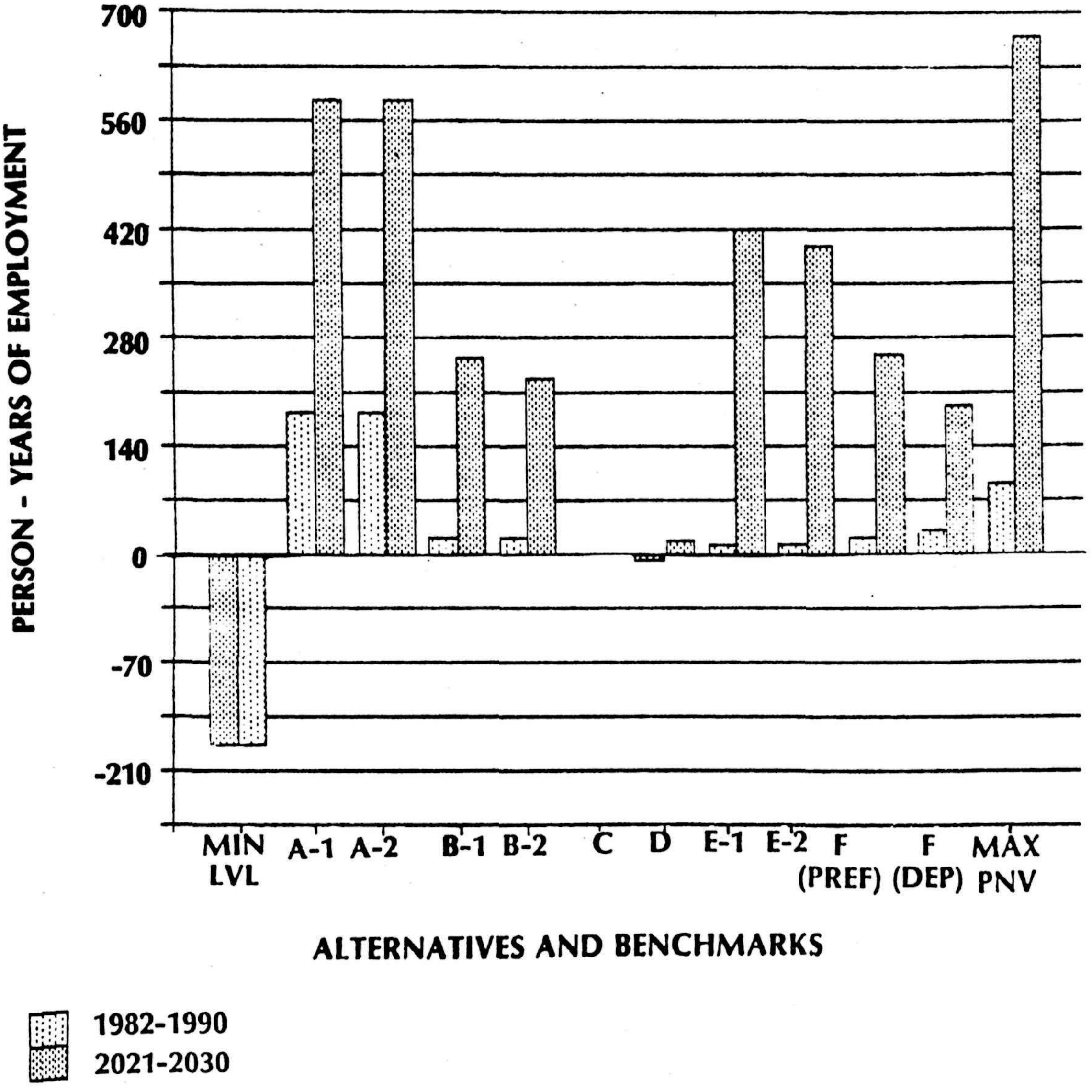
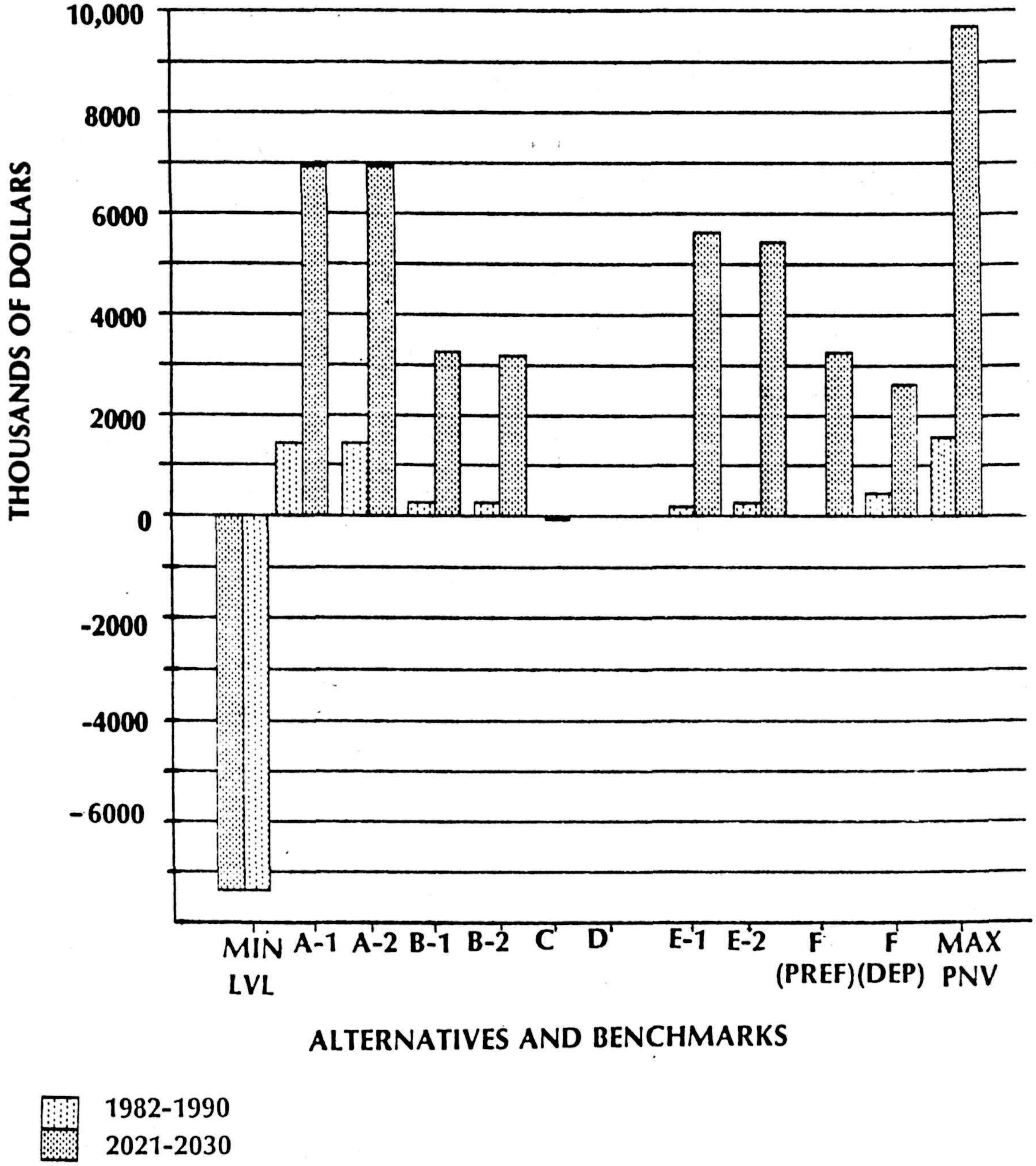


FIGURE 2.23
INCOME CHANGES
FROM CURRENT PLAN



COMPARISON OF QUALITATIVE NET PUBLIC BENEFITS

Introduction

The interdisciplinary team evaluated the alternatives to determine which alternative maximized net public benefit. Net public benefit is important since it represents the overall value to the nation of all benefits less all costs, regardless of whether the costs and benefits are expressed in quantitative (PNV) or qualitative terms (often subjectively measured). The PNV component of each alternative's net public benefit is displayed in Table 2.10.

Each alternative is compared as to how well it addresses the qualitative components of net public benefit. The qualitative components of net public benefit include:

1) Elk Hunting Quality - The quality of big elk hunting varies by alternative. Currently elk hunting quality indicators include the length of the hunting season and the population structure of the animals harvested. Both quality indicators are influenced by the currently unroaded situation on much of the Forest. Timber harvesting on elk hiding cover areas would have varying impacts on elk hunting quality. Each alternative was examined to determine its impact on elk hunting quality and whether or not the PNV trade-offs are acceptable.

2) Semi-Primitive Recreation Setting - According to public involvement comments the maintenance of a semi-primitive recreation setting in certain parts of the Forest is important to large segments of the public. Areas close to Great Falls and those with well established semi-primitive use patterns are highly valued. This locational factor is not valued in FORPLAN, but the tradeoffs in term of PNV foregone need to be examined with the subjective values expressed by the public. Areas of prime interest include Tenderfoot/Deep Creek/Pilgrim Creek, Middle Fork/Lost Fork of the Judith, and Big Snowies. Each alternative was examined in light of its impacts on these areas.

3) Threatened and Endangered Species Habitat - The values of maintaining or restoring viable populations of T&E species are not included in PNV. Each alternative's impact on T&E species habitat is evaluated on the quantity of large semi-primitive recreation areas each alternative contains and if the tradeoffs in terms of PNV foregone is worth the T&E species habitat provided.

4) Plant Diversity - The value of maintaining long term plant diversity is also considered as a qualitative component of net public benefits. Scientific research opportunities, gene pool maintenance and the reduction of insect and disease risk are some of the reasons plant diversity is worth examining. Plant diversity as discussed here refers to horizontal diversity, i.e., the acres that are contained in old growth, post and poles, seedling-sapling stage, and in the grass forb stage. Timber harvesting is the primary method of vegetative manipulation outside of classified wilderness and wilderness study areas.

5) Visual Quality - Visual quality constraints have been included in the FORPLAN runs and therefore reduce the PNV. Whether the benefits produced exceed the costs involves a subjective component that needs to be considered in the qualitative net public benefit analysis.

6) Lifestyles and Business Stability - The opportunities for local people, ranchers and small business to make use of posts, poles, and/or firewood are not valued in the PNV. The maintenance of existing lifestyles of ranches and businesses that are often dependent on the access opportunities to such Forest products. Such opportunities vary by alternative.

7) Off-Forest Water Use - Over 300,000 acres of private lands are dependent on the Forest as a source of irrigation water. This value is not included in PNV but is considered as the quantity and quality of water varies with each alternative.

8) Human & Community Development Programs - The training and learning value to enrollees of such programs are a qualitative component of net public benefits. The outputs they produce on the Forest are included in the PNV. They would not be affected by any alternative.

The quantitative and qualitative components of net public benefits discussed above are addressed as they apply to each alternative. For further information on the quantifiable costs, benefits and projected real cost and value indices, see the planning record, "Economic Data and Analysis."

Current Plan

The Current Plan would lower the quality of elk hunting. Although timber harvest levels do not increase, areas roaded for timber harvest would increase because the current direction provides for roading undeveloped lands. Because hunters would have easier and quicker access to elk, a reduction in the hunting season would be needed in order to maintain elk populations. (NOTE: The State of Montana has the responsibility and authority in setting hunting seasons and limits). Also the population structure would probably change from older, branch antlered, mature animals to younger spiked animals. This change in population structure would also reduce the quality of elk hunting.

Some of the special semi-primitive recreation areas would be accessed*, including part of the Logging Creek area. Accessing Logging Creek would lower the benefits people from the surrounding communities receive from having this area unroaded. MWSA areas would remain unroaded.

Some threatened and endangered species habitat would be accessed, in particular the Two Medicine River, Badger, South Badger, and southeast Benchmark areas. Roading these areas, while not lowering the population of threatened and endangered species, would lower the quality of occupied habitat.

Plant diversity would remain high. The Lewis and Clark National Forest currently has a high level of plant diverstiy in most areas. Timber harvest at current levels would retain this diversity.

While all alternatives meet visual quality objectives, the Current Plan ranks 7th out of 10 in acres contained in the modification class.

The opportunity to make use of posts, poles, and/or firewood would increase slightly.

Water quantity would not change. Sedimentation would decrease slightly as activity-caused erosion problems are corrected.

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* See alternative maps in order to determine which areas are accessed by each alternative.

Alternative A-1, & A-2

Alternatives A-1 and A-2 would drastically lower the quality of elk hunting in many areas of the Forest. Because most of the lands are accessed for timber, hiding cover would be reduced. With less hiding cover, animals would be harvested quickly. Consequently the hunting season would need to be shortened and fewer mature animals would be available.

In Alternative A-2, nearly every area of high public interest would be accessed. Alternative A-1 would recommend the MWSA areas as wilderness, but all other areas of special interest would be roaded. Alternatives A-1 and A-2 would have low public benefits in retaining semi-primitive recreation areas.

The quality of threatened and endangered species habitat would decrease the most in Alternatives A-1 and A-2. These alternatives road more land than other alternatives.

Plant diversity would be increased in some areas of the Forest as timber harvest levels increase. Alternative A-2 would have the greatest affect on diversity.

Alternative A-1 affects visual quality the most. It contains the most acres in the modification class. Alternative A-2 ranks fifth.

The opportunity to make use of posts, poles, and/or firewood would increase significantly. Alternative A-2 would prohibit these activities in the MWSA areas.

Water quantity would increase up to 20,000 acre feet. Sedimentation would triple.

Alternative B-1, & B-2

Alternatives B-1 and B-2 would also lower the quality of elk hunting although not as severely as Alternatives A-1 and A-2. Hiding cover would be reduced. Seasons would need to be shortened.

In Alternative B-2, all special interest areas would be accessed with the exception of the upper elevation lands in the Big Snowies. The Tenderfoot/Deep Creek/Pilgrim Creek would not be accessed until after 2030. This would lower the benefit people from the surrounding communities receive from having these areas unroaded. In Alternative B-1, the MWSA areas would remain unroaded; however, all other special interest areas would be accessed by 2030.

Threatened and endangered species habitat would be accessed in the Two Medicine - North Badger and southeast Benchmark areas.

Plant diversity would increase slightly as timber harvest levels increase.

Alternative B-2 ranks second in acres contained in the modification class. Alternative B-1 ranks fourth.

The opportunity to make use of posts, poles, and/or firewood would increase. Alternative B-2 would prohibit these activities in the MWSA areas.

Water quantity would increase up to 10,000 acre feet. Sedimentation would double.

Alternative C

Alternative C would increase the quality of elk hunting the most of any alternative. Timber harvest levels do not increase and are restricted on winter range; grazing on winter range decreases slightly and investment is high in wildlife habitat improvement. These factors contribute to an increase in the overall elk population potential. The population structure should be maintained or improved.

Most of the special semi-primitive recreation area, including the MWSA areas, would be maintained. Only the upper part of Logging Creek would be accessed.

Threatened and endangered species habitat in the Two Medicine and southeast Benchmark areas would be accessed. Roading these areas, while not lowering the population of threatened and endangered species, would lower the quality slightly of occupied habitat.

Plant diversity would remain high. Timber harvest at current levels would retain this diversity.

While all alternatives meet visual quality objectives, Alternative C ranks 8th out of 10 in affecting visual quality.

The opportunity to make use of posts, poles, and/or firewood would increase slightly.

Water quantity would not change. Sedimentation would decrease slightly as activity-caused erosion problems are corrected.

Alternative D

Alternative D would lower the quality of elk hunting slightly. Although hiding cover would be retained, the increase in domestic grazing on elk winter range would reduce the overall elk population.

Some special semi-primitive recreation areas would be accessed including the upper part of Logging Creek and the lower part of Pilgrim Creek. Accessing these areas would lower the benefits people from the surrounding communities receive from having these areas unroaded. MWSA areas would remain unroaded.

Some threatened and endangered species habitat would be accessed, in particular the Two Medicine River, Badger, North Badger, and southeast Benchmark areas. Roading these areas, while not lowering the population of threatened and endangered species, would lower the quality of occupied habitat.

Plant diversity would remain high. Timber harvest at current levels would retain this diversity.

While all alternatives meet visual quality objectives, Alternative D ranks 9th out of 10 in acres contained in the modification class.

The opportunity to make use of posts, poles, and/or firewood would increase slightly.

Water quantity would not change. Sedimentation would increase by about 50 percent largely due to the increased grazing in riparian zones.

Alternative E-1, & E-2

Alternatives E-1 and E-2 would drastically lower the quality of elk hunting in the Jefferson Division. Because most of the lands are accessed for timber, hiding cover would be reduced. With less hiding cover, animals would be harvested quickly. The hunting season would need to be shortened and fewer mature animals would be available. The quality of elk hunting in the Rocky Mountain Division would be maintained.

In Alternative E-2, nearly every area of high public interest would be accessed. Alternative E-1 would recommend the MWSA areas as wilderness, but all other areas of special interest would be roaded. Alternatives E-1 and E-2 would have low public benefits in retaining semi-primitive recreation areas.

The quality of threatened and endangered species habitat would not be affected.

Plant diversity would increase in the Jefferson Division as timber harvest would have the greatest effect on diversity. E-2 would have a great effect on diversity.

While all alternatives meet visual quality objectives, Alternative E-2 ranks 3rd out of 10 in acres contained in modification class.

The opportunity to make use of posts, poles, and/or firewood would increase significantly. Alternative E-2 would prohibit these activities in the MWSA areas.

Water quantity would increase up to 20,000 acre feet. Sedimentation would almost triple.

Alternative F - Preferred

Alternative F (Preferred) would lower the quality of elk hunting slightly. Although Alternative F retains the most undeveloped lands, it increases timber harvest on roaded lands. Increased timber harvest would cause some easier and quicker access to elk and there may be a need to reduce the hunting season in some specific areas.

The upper Middle Fork of the Judith would be accessed. All other special semi-primitive recreation areas would remain undeveloped.

Some threatened and endangered species habitat would be accessed, in particular the Two Medicine River and southeast Benchmark areas. Roading these areas, while not lowering the population of threatened and endangered species, would lower the quality slightly of occupied habitat.

Plant diversity would remain high. The proposed timber harvest level would increase diversity slightly.

Alternative F has the least effect on visual quality.

The opportunity to make use of posts, poles, and/or firewood would increase.

Water quantity would increase up to 10,000 acre feet. Sedimentation would increase by about 25 percent.

Alternative F - Depart

Alternative F (Departure) would lower the quality of elk hunting. Alternative F (Departure) reduces the undeveloped lands by 255,000 AUMs and, it increases timber harvest on roaded land, especially during decades, 3, 4, and 5. Increased timber harvest would cause easier and quicker access to elk and most likely there would be a need to reduce the hunting season.

Although Alternative F (Departure) accesses the same threatened and endangered species habitat, the harvest of timber during decades 3, 4, and 5 would be at a significantly increased rate. This would lower the quality of occupied habitat.

Alternative F (Departure) would add about 250,000 acres to the modification visual quality objective.

The opportunity to make use of posts, poles, and/or firewood would increase.

Water quantity would increase up to 10,000 acre feet. Sedimentation would increase by about 45 percent.

CLIFFS ON KINGS HILL ABOVE NEIHART.

DEIS
SECTION 1

CHAPTER III
AFFECTED ENVIRONMENT

Overview

This chapter, Affected Environment, briefly describes the physical, biological, social, and economic environments of the Lewis and Clark National Forest that would affect and would be affected by the alternatives. The first part of this section gives a general description of the Forest. The last part of this section is a detailed description of the resources and social and economic environments that would be affected by the alternatives.

GENERAL DESCRIPTION

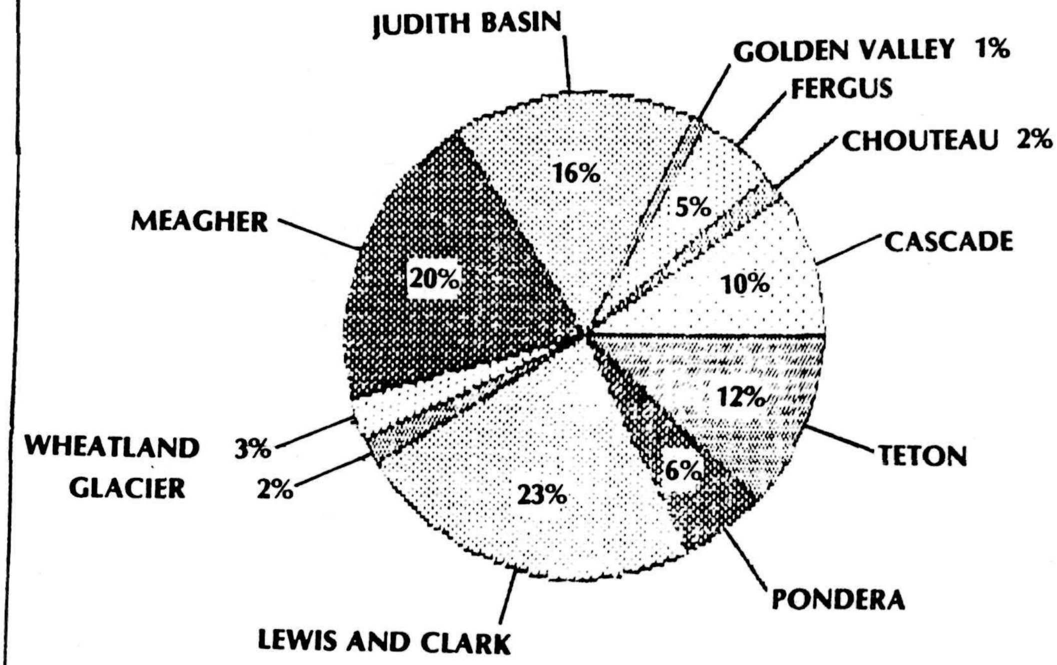
FOREST ACREAGE

The gross area within the boundaries of the Lewis and Clark National Forest, as of January 1, 1981, is 1,999,020 acres. National Forest lands amounting to 1,843,395 acres are for the most part in large consolidated blocks.

Private Land

Private lands account for 155,625 acres of the gross area. The west edge of the Little Belt Mountains and the north side of the Crazy Mountains contain large areas of intermingled private lands. These lands, together with smaller tracts scattered within the boundary, resulted from early day homesteads, patented mining claims, and railroad grants. Currently recreation, agriculture in the form of hay production and livestock grazing, timber management, mining, and residential development are major uses of these tracts. Figure 3.1 shows the percentage of National Forest acres by county.

FIGURE 3.1 **COUNTY ACRES**



GENERAL DESCRIPTION

GENERAL TOPOGRAPHY

Topography ranges from the steep, rugged, and precipitous slopes of the Rocky and Big Snowy Mountains to gently rolling terrain with broad plateaus and deep valleys in the Castles and Little Snowy Mountains. Elevations range from 9,362 feet in the Rocky Mountains to 4,500 feet in the Lower Deep Creek - Smith River area of the Little Belt Mountains.

Jefferson Division

The mountain ranges of the Jefferson Division are dome-like structures with smooth, rounded tops flanked by valleys. The Big Snowy, Little Snowy, and eastern end of the Castle Mountains were formed from uplifted, tilted limestone beds.

The Crazy and Highwood Mountains consist of volcanic rocks. The Little Belt Mountains have a core of igneous rocks; sandstone and shale are exposed on the higher ridges. The north and south facing flanks of the Little Belts consist of uplifted and tilted limestone beds.

The west end of the Castle Mountains has a dome of intrusive igneous rock injected into older, uplifted limestone beds. Surface topography of these ranges is largely due to the erosive action of frost and water.

Rocky Mountain Division

Locally, the Rocky Mountains resulted from extensive overthrusting and faulting of sedimentary rock. They have very steep ridges and narrow valleys and consist of alternating layers of hard limestone or dolomite and softer sandstone and shale. The hard limestone and dolomite form the ridges with the softer shales and sandstones underlying the valleys. The spectacular peaks and steep ridges in these mountains are largely the result of alpine glaciation. The gently rolling topography in the valley of the North Fork of the Sun River and Two Medicine Valley is at least partially due to the scouring action of glaciers.

CLIMATE

Climate on the Forest varies from cool and semi-arid to cold and humid. Precipitation ranges from 14 inches annually on the lower slopes of the Jefferson Division to 65 inches on the highest ridges in the Rockies. Fifty to eighty percent of this moisture occurs as snow. The growing season for native plants is limited by moisture on low elevation lands and by cold temperatures at higher elevations. On low elevation lands plant growth begins in late April or early May and is ended by lack of moisture in mid-August. On high elevation lands, plant growth begins in late May or early June and is terminated by frost in late August. An important climatic factor is the frequent strong winds. Chinook winds during the winter cause dramatic temperature changes, as much as 50 degrees in one hour.

BLACKFEET TREATY RIGHTS

The northern part of the Rocky Mountain District was once part of the Blackfeet Indian Reservation. The Blackfeet Indian Nation retains certain use rights on these lands under the Agreement of 1896. The Treaty Rights Agreement of 1896 between the United States and the Blackfeet Tribe specifically granted rights to the Blackfeet Tribe to use "any portion of these lands... to cut and remove therefrom wood and timber for agency and school purposes, and for their personal uses for houses, fences, and all other domestic purposes."

TENDERFOOT EXPERIMENTAL FOREST

The 9,125 acre Tenderfoot Experimental Forest, located in the Little Belt Mountains, was established in 1961 for the development of management techniques for harvesting lodgepole pine while maintaining soil stability. The research also will provide methods for improving water yields without aggravating snowmelt, summer storm peaks, and sediment production. Since establishment of the Experimental Forest, development has been minimal. In 1978, a new research proposal to study "multiple resource management of eastside subalpine forest lands in Montana" was made. In 1980, an additional proposal was made to conduct research to "improve our ability to assess, predict, and control non-point pollution from Forest operations." No research projects have been funded.

RESEARCH NATURAL AREAS

Research natural areas serve as ecological reference points or as experimental controls, against which it is possible to measure and assess the results of our management activities. Research natural areas also serve as field laboratories and store houses of genetic diversity. One area, Paine Gulch near Monarch in the Little Belts, has been recommended as a research natural area.

AFFECTED RESOURCES

RECREATION

The amount of recreation facilities and types of recreation settings provided in each alternative affect the social and economic environment within the Forest and the nearby communities. For discussion, recreation is divided into developed and dispersed recreation and visual quality.

Developed Recreation

Recreation is one of the major uses of the Forest. Developed recreation sites in the public sector include campgrounds, picnic areas, fishing access, boat ramps, and trailhead facilities. The Forest's 31 sites, occupying 195 acres, can provide 198,538 RVDs of use (based on optimum use at 40 percent of design capacity during the managed season). The Forest, under special use permits, administers 178 summer home sites. In addition, the private sector can provide 56,100 RVDs of downhill skiing at two ski areas, and 33,500 RVDs of resort use at eight resorts.

Annual projected developed recreation use is:

1985 - 168,900 RVDs
1991-2000 - 189,000 RVDs
2001-2010 - 211,300 RVDs
2011-2020 - 236,500 RVDs
2021-2030 - 264,600 RVDs

There is a high demand for downhill skiing on a national level and users are for the most part a highly mobile group. Nonetheless, a high percentage of users on the two ski areas on the Forest are local. Three additional potential ski areas have been identified on the Forest; however, they have not been evaluated in depth. Any expansion or new construction would be considered on a case by case basis.

Dispersed Recreation

The Forest provides a wide range of dispersed recreation including hiking, camping, backpacking, fishing, hunting, off-road vehicle use, cross-country skiing, picnicking, birding, photography, wilderness use, and nature study. These activities take place in recreation settings ranging from primitive to rural. Many activities are centered around the Forest trail system. Driving for pleasure, hunting, camping, snowmobiling, and hiking (in that order) are the most popular activities.

Recreation opportunity is the projected capacity of an area to provide dispersed recreation based on the area's recreation setting.

Projected dispersed recreation use is:

1985 - 700,000 RVDs
1991-2000 - 894,000 RVDs
2001-2010 - 1,088,000 RVDs
2011-2020 - 1,283,000 RVDs
2021-2030 - 1,477,000 RVDs

Hunting and fishing is a sizable dispersed recreation use on the Forest. Nearly 3 out of 5 Montanans in the license-required group take part in one or more fishing or hunting activities. Another 170,000 licenses are purchased by out-of-state visitors. Nonconsumptive wildlife pursuits such as photography, nature study, and birding are rapidly increasing.

Annual hunting seasons are held on the Forest for elk, mule deer, whitetail deer, bighorn sheep, black bear, grizzly bear, antelope, and mountain goat. Based on total population and hunter harvest, the mule deer is the primary animal hunted. However, in terms of interest and popularity, elk hunting ranks higher than any other big game hunting.

Visual Quality

The acres managed under the different visual quality objectives vary by alternative. Therefore, aesthetic values will change as will user satisfaction based on preference. Visual quality is primarily a part of the social environment. While changes in visual quality result from changes in the physical and biological environment, visual quality is based on social values.

WILDERNESS

Classified Wilderness

A 385,046 acre portion of the Bob Marshall-Great Bear-Scapegoat Wilderness Complex is located on the Forest. The area extends about 60 miles from north to south along the Continental Divide on the Rocky Mountain Division. Elevation varies from 5,000-foot valley floors to more than 9,000 feet along the Continental Divide. Visitors travel by foot and horseback. Topography ranges from rugged, precipitous ridgetops to gentle sloping alpine meadows and forested river bottoms. Fossils of extinct animals a billion years old are found in the limestone. The area has changed slightly since the first white man came to Montana. All the big game animals of the West live here including the wolverine, grizzly bear, deer, elk, moose, and black bear, as well as mountain goat, sheep, and mountain lion. Fish are plentiful. A well developed trail system exists in the area.

Recommended Wilderness

The 31,304 acre Renshaw and 32,000 acre Silver King-Falls Creek area have been recommended for wilderness classification under the RARE II (Roadless Area Review and Evaluation) study. These areas are contiguous to the Bob Marshall-Great Bear-Scapegoat Wilderness Complex.

Further Planning Areas

The 41,838 acre Deep Creek-Reservoir North area in the Rocky Mountain Division was selected for further planning under RARE II study. This area receives primitive recreation use and has high wildlife values for such species as grizzly bear, elk, mountain goat, and bighorn sheep. The further planning area has a very good potential for natural gas. This area will remain under further planning status until oil and gas potential has been determined.

MWSA Areas

The 92,000 acre Middle Fork Judith and 97,885 acre Big Snowies areas located in the Jefferson Division are being studied for wilderness classification as required by the Montana Wilderness Study Act of 1977. These areas are described in detail in Section 2.

Wilderness Opportunity

Wilderness opportunity varies from the present 385,046 acres, if Congress did not include any recommended areas or study areas in the National Wilderness Preservation System, to 680,073 acres if all recommended areas and study areas were added to the System. Wilderness activities affect the physical and biological environment. Use of wilderness in the form of recreation, or in some cases grazing, affects the social and economic environments of the Forest and surrounding communities.

WILDLIFE AND FISH

The wide variety of terrain and vegetative types found on the Forest provide habitat for numerous species of wildlife and fish. These wildlife and fisheries resources are among the most diverse and important in the Northern Region with habitat provided for 290 species. Total estimated number of species by general groupings and the number considered to be game species are:

SPECIES GROUP	TOTAL SPECIES	GAME SPECIES
Mammals	72	10
Birds	190	24
Reptiles	7	0
Amphibians	8	0
Fishes	13	7
TOTAL	290	41

Threatened and Endangered Species

Grizzly bears, a threatened species, are found throughout the Rocky Mountain Division. This area and adjacent areas on the Flathead, Helena, and Lolo National Forests and Glacier National Park provide habitat for the largest population of grizzly bears in the United States, outside of Alaska. The current population estimate for grizzly bear on the Forest is 100 animals.

Observations of gray wolves, an endangered species, are occasionally reported on the Rocky Mountain District. Recent population estimates are from 4-8 wolves in the general area.

Bald eagles, an endangered species, are commonly observed on various portions of the Forest during spring and fall migrations. The peregrine falcon, an endangered species, is rarely observed on or near the Forest during seasonal migrations.

Big Game

Major populations of big game species winter on or near the Forest. In the spring, these animals migrate to summer range located at the higher elevations of the Forest. Important lambing and calving areas are located along these migration routes.

Estimated 1980 populations of the major big game species on the Forest are:

Elk	8,500
Mule Deer	30,000
Whitetail Deer	4,500
Bighorn Sheep	1,000
Mountain Goat	500

Elk

Populations of elk are found in all of the mountain ranges. The Sun River and Judith elk herds are among the major herds in the State. The Rockies, Little Belts, Highwoods, Castles, and Crazy Mountain ranges all support sizable elk populations, and smaller herds are present in the Big and Little Snowies. The Forest provides about 50 percent of the elk winter-spring habitat needs. The remainder is on private land outside the Forest.

Mule Deer

Mule deer live throughout the Forest during the spring, summer, and fall. Some important mule deer winter habitat is at low elevation areas, although much of the winter habitat is on private land outside the Forest.

Other Big Game

The Sun River bighorn sheep herd, numbering nearly 1,000 head, is the largest in the State. White-tailed deer and black bear are widely distributed on the Forest. Rocky Mountain goats are found on portions of the Forest, with the largest population in subalpine and alpine areas of the Rocky Mountain Division. Antelope live in the foothills of the eastern portion of the Jefferson Division. A few moose are found in scattered portions of the Forest.

Sun River Game Preserve

The Sun River Game Preserve was established by the Montana State Legislature in 1913 and has retained that status continuously to the present time. The Preserve contains 199,661 acres of mountainous country lying east of the Continental Divide in the headwaters of the Sun River drainage in the Bob Marshall and Scapegoat Wildernesses.

Human use of the area is largely devoted to various wilderness oriented recreational activities. Sport hunting, which is an accepted activity under the Wilderness Act, is prohibited by the Legislative status of the Preserve. Other recreational pursuits such as fishing, backpacking, and camping are permitted.

A variety of big game animals depend upon the habitat provided by the Sun River Game Preserve either seasonally or year around. Elk, bighorn sheep, mule deer, white-tailed deer, mountain goat, black bear, grizzly bear, and moose all use portions of the Preserve.

On the basis of the big game habitat inventory completed during 1973, conditions on the important big game ranges within the Sun River Game Preserve are generally good. There are some areas on the transitional ranges where heavy spring grazing by elk has resulted in some deterioration in range condition.

Small Game Species

Small game species include grouse, turkey, and white-tailed ptarmigan. Three species of forest grouse live on various parts of the Forest. Wild turkeys are well established on the south side of the Big Snowies and in the Little Snowy Mountains. Northern white-tailed ptarmigan are in areas above the timberline in the Rocky Mountains.

Non Game Species

In addition to these game species, many other classes of wildlife live throughout the Forest. Various species of furbearers, predators, rodents, and other nongame animals and birds live on different portions of the Forest.

Fish

Cold water fish species, including rainbow trout, eastern brook trout, cutthroat trout, and mountain whitefish, are present in all the larger streams. The Forest has 1,600 miles of streams; 535 miles are considered to be fish habitat. Several small natural and artificial lakes support populations of trout. Gibson Dam impounds a large reservoir on the Sun River; however, it provides only marginal fish habitat due to large annual fluctuations in water levels.

Management Indicator Species

The regulations developed under the National Forest Management Act discuss which species should be considered as management indicator species. They include those species identified as endangered or threatened on Federal and State lists for the planning area. The peregrine falcon and gray wolf are classified as endangered under both Federal and State law. The bald eagle is listed as endangered on the Federal list, but is not included on the State list. The grizzly bear is listed as threatened at the Federal level, but is managed as a big game animal under Montana regulation. The population status and habitat conditions for each of these species is currently being monitored on the Forest by the U.S. Fish and Wildlife Service, Forest Service, and Montana Department of Fish, Wildlife, and Parks.

The NFMA regulations also include species commonly hunted, fished, or trapped as management indicator species. On the Lewis and Clark National Forest that category would include eight big game species (elk, mule deer, whitetail deer, black bear, antelope, bighorn sheep, mountain goat, and mountain lion), three species of mountain grouse (blue, ruffed, and spruce), three species of trout (cutthroat, rainbow, and brook), and three species commonly trapped for their fur (beaver, coyote, and bobcat). Population parameters, harvest levels, and general habitat conditions are currently monitored for all of these species by the Montana Department of Fish, Wildlife, and Parks.

Management indicator species may also be selected to indicate special habitat needs that may be influenced significantly by planned management programs or to indicate effects of management activities on other species of a major biological community. Table 3.1 lists management indicator species selected for the Lewis and Clark National Forest to represent various habitat situations.

TABLE 3.1 **MANAGEMENT INDICATOR SPECIES**

SPECIES	HABITAT SITUATION
Goshawk	Old Growth Forest
Golden-Crowned Kinglet	Mature Coniferous Forest
Hairy Woodpecker	Tree Cavity (Doug fir/Ponderosa)
Downy Woodpecker	Tree Cavity (Riparian/Aspen)
Black Backed Three-Toed Woodpecker	Tree Cavity (Mixed Conifer)
Northern Three-Toed Woodpecker	Tree Cavity (Lodgepole Pine)
Mountain Phenacomys	Mountain Grassland
Brewer's Sparrow	Sagebrush Grassland
Meadow Vole	Wet Meadow
Water Pipit	Alpine
Yellow-Bellied Marmot	Talus, Rockland
Beaver	Riparian (Deciduous Tree)
Yellow Warbler	Riparian (Tall Shrub)
Cutthroat Trout	Aquatic (Streams and Lakes)
Brook Trout	Aquatic (Streams)

RANGE

The current domestic grazing level is 80,754 AUMs (animal unit months) including waived, private land. This includes the following categories:

Type of Permit	National Forest
Term Permits	67,214 AUMs
Temporary Permits	1,541 AUMs
Livestock Use	3,527 AUMs
TOTAL	72,282 AUMs
	Private Land
Waived Private Land	8,472 AUMs

The majority of this grazing takes place on 391,500 acres of land identified as suitable for grazing on existing allotments. As part of their ranching operation, 244 permittees currently utilize National Forest grazing.

Current management direction provides for no range deterioration caused by domestic livestock and for improved distribution of animals on existing allotments. Improved range management is needed on several range allotments. A higher level of range administration is needed on most allotments.

Sheep grazing on the Forest has decreased from 53,000 animals in 1946 to 4,400 animals in 1981.

Historically, cattle numbers have fluctuated up and down based on a number of variables, including costs, beef prices, and overall economic conditions. With the overall rise in per-capita consumption of beef and the projected growth in population, demand for beef is expected to double by 2030. Since numbers at the local level have closely followed state and national trends, cattle numbers in Central Montana are expected to climb.

TIMBER

Timber products harvested from the Forest have made major contributions over the last 100 years to the development of central Montana and the welfare of its inhabitants. All parts of the Forest, including the Sun River drainage now within the Bob Marshall Wilderness, were used as a source for house logs, fence posts, corral poles, mine timbers, railroad ties, rough lumber, and fuelwood. During the period 1946-1951, pulpwood was harvested from several areas within the Little Belt Mountains. As the demand for pulpwood decreased, sawtimber became important. Douglas fir and lodgepole pine are the primary species produced on the Forest. Ponderosa pine, spruce, and subalpine fir are present in lesser amounts.

The current timber sale program is 13 million board feet per year (85 percent chargeable and 15 percent non-chargeable) on a land base of 554,213 acres of available and capable Forest lands (see Table 3.2).

TABLE 3.2 LANDS CAPABLE AND AVAILABLE FOR TIMBER HARVEST

Lewis and Clark National Forest (Total Acres)	1,843,395
Lands Not Capable for Timber Production	
Water	4,655
Non-Forested Areas	482,205
Non-Productive Areas	491,475
TOTAL CAPABLE ACRES	865,060
Lands Not Available for Timber Production	
Productive Reserved	
Wilderness	176,872
Experimental Forest	8,273
Productive Deferred	
RARE II Recommended Wilderness	17,385
RARE II Further Study	4,227
MWSA Areas	104,090
TOTAL CAPABLE AND AVAILABLE ACRES	554,213

Firewood

Besides timber harvested through commercial sawlog sales, an additional 15 million board feet per year of dead trees are removed as firewood. About 95 percent of the firewood removal is under free use permits for individual personal use, and 5 percent is under paid permit for commercial use.

Timber Harvest

Timber harvest is designed to achieve multiple use objectives, including wildlife habitat improvement, transitory range, and insect and disease control. Harvesting is accomplished through the application of silvicultural systems, such as clearcutting, two- and three-step shelterwood, and selection.

Commercial harvest systems have been limited to tractor logging on slopes less than 45 percent. A reforestation backlog does not exist because natural regeneration has been generally successful.

Wood Processing

Sawmills and processing plants presently in operation at White Sulphur Springs, Judith Gap, Townsend, and Livingston process approximately 75 to 90 percent of the annual Forest harvest. The remaining volumes are processed by several smaller mills and individuals as lumber, post, and poles. These four mills, running one shift, have an annual production capacity of about 86 million board feet.

Private lands have been producing more than their share of timber. Some of the private land has not been reforested, but rather is being converted to grazing land. This will have an effect on demands for Forest timber in the future.

Demand

The 1978 East Zone Timber Program Analysis concluded that because the supplies of private timber have been decreasing and the cost of harvesting has risen steadily in relation to National Forest timber costs, the demands for Forest timber will increase within the next five to ten years.

WATER

Water quality and quantity are affected by management activities. Water quality is part of the physical environment. Quantity, primarily as it affects irrigation, is part of the economic environment. All consumptive water rights for the Forest have been identified and prepared for filing with the State of Montana. The State of Montana Department of Fish, Wildlife, and Parks is making water right filings for in-stream flow for fish and recreation use.

Irrigation

Irrigation is the most important economic use of water. Irrigation uses much of the available water in the mid and late summer months and much of the spring runoff where storage is available. Water from the Musselshell, Judith, North Fork Smith, Sun, Two Medicine, Teton Rivers, and from most streams with a dependable flow is used. An estimated 295,000 acre feet of water is used for irrigation annually from the Missouri, Sun, and Smith River Basins with numerous reservoirs and canals providing storage areas. Irrigation is more prevalent on the Rocky Mountain Division than the Jefferson Division.

Demand

Demand for water is derived from the willingness of users to pay for its use. It arises from the contribution that water makes toward the production of the final product. The basis for demand for irrigation water comes from the next increase in income a farmer receives from the land made productive by irrigation. Because water for industrial or domestic uses has a higher price return than irrigation water, water can be bid away from agricultural use. As a result, irrigation is considered the marginal use.

The passage of a major state water development plan by the 1981 Montana Legislature indicates that the demand for water will undoubtedly increase, mostly for irrigation and including additional storage or reservoir capacity.

The need for irrigation water will probably increase with the expected increase in production of crops and livestock. Much of the irrigated cropland is used for beef production. Therefore, since livestock numbers are expected to increase during 1981-85, more surface and storage water will be needed.

Currently, localized water shortages, especially in the late summer months, occur on the Smith, Dearborn, Sun, Teton, and Musselshell Rivers. Such shortages could be expected to continue or even increase.

Projections made for the Missouri River Basin in the Missouri River Basin Study Comprehensive Framework Study indicate that irrigation should increase by 407,000 acres by 2000, and 550,000 acres by 2020. Although the Lewis and Clark National Forest is only a small part of the Missouri River Basin, the trends are probably still applicable.

Other Uses

The need for municipal water and energy will increase, in addition to an expected increase in the need for irrigation water, as population increases in surrounding communities. Population projections for the year 2000 show that Cascade and Lewis and Clark Counties will increase by 18 percent and 40 percent, respectively. Population projections in the other counties in the area-of-influence show relatively stable populations with little or no change.

In-stream uses must also be considered, in addition to consumptive uses. Although they are difficult to assess in terms of demand, they are nonetheless important. Examples of in-stream use are hydroelectric power generation, preservation of fish and riparian habitat, and recreation. Most of these uses have intrinsic values that are more difficult to measure than consumptive uses, yet they must compete with consumptive uses.

MINERALS
OIL AND GAS

Activities associated with minerals affect all environments of the Forest and surrounding communities; physical, biological, social, and economic.

Leasing Process

The BLM (Bureau of Land Management) is responsible for mineral leasing on Federal lands under the Mineral Leasing Act of 1920. By interagency agreement, the BLM refers all applications to lease National Forest lands to the Forest Service for review and recommendation. The Forest Service then recommends to the BLM whether or not those lands should be leased and, if so, what controls (stipulations) are needed to protect surface values and uses.

Stipulations

These stipulations include no-surface occupancy, surface occupancy, timing restrictions, limited surface use, and activity coordination. No-surface occupancy precludes well drilling and pipeline construction, but permits passive activities such as seismic exploration. Surface occupancy timing restriction prohibits surface occupancy of certain activities in specified areas such as essential wildlife habitat, trails, roads, streams, lakes, and other improvements. Limited surface use is used to protect areas of special value such as municipal watersheds, soils that are susceptible to slumping, and other sensitive areas that are difficult to define at this stage. This stipulation gives the Forest Service the authority to modify site specific proposals. Activity coordination stipulation limits activity levels in time and space and is needed to protect threatened and endangered species.

Current Leases

Based on previous environmental analyses, 456,898 acres of the Forest have been leased or recommendations have been made. Another 63,122 lease applications are pending in the Silver King-Falls Creek and Renshaw Recommended Wilderness. Lease applications have been made on 355,112 acres of the Bob Marshall and Scapegoat Wildernesses (Lewis and Clark National Forest). See Table 3.3.

The Bob Marshall-Scapegoat-Great Bear Wilderness Complex was withdrawn from oil and gas leasing on June 1, 1981. This withdrawal was revoked on January 29, 1982. Congress is currently considering several legislative proposals dealing with minerals and mineral leasing in wilderness and oil and gas leasing in the Bob Marshall-Scapegoat-Great Bear Wilderness Complex.

Exploratory Drilling and Field Development

Leasing is only the first step of a multi-step decision process. Subsequent steps occur when the leasee submits operating proposals; each proposal is subject to environmental analysis. Activities on leases that do not involve exploratory drilling or field development are regulated by the Forest Service. Exploratory drilling and field development activities are regulated by the USGS (U.S. Geological Survey). Through a Cooperative Agreement, the USGS is responsible for enforcement of surface protection and reclamation requirements established by the Forest Service. Although the Forest Service does not retain the approval authority for certain activities on leases, it does participate in review and approval of all drilling applications, and on-the-ground administration of all on-going projects in conjunction with the USGS.

Current Activity

Oil and gas exploration is highly speculative. Activity seldom proceeds beyond preliminary exploration or exploratory drilling in any given leased area. Preliminary exploration is ongoing on much of the Forest. Most of the activity is occurring in the Rocky Mountain Division.

On the Rocky Mountain Division, seismic surveys are generally being conducted with a northeast-southwest orientation perpendicular to the general geologic structures of the area. These surveys will probably continue for several years with activity becoming increasingly localized on the most promising structures. Due to the number of different potential leasees in this area, several concurrent seismic operations may occur at any given time and individual areas may be surveyed repeatedly.

National demand is increasing, however, and prices for oil and gas and other factors have created an environment where oil and gas activity will increase.

TABLE 3.3 LEASE STATUS AND STIPULATION REQUIREMENTS

	ROCKY MOUNTAIN DIVISION						JEFFERSON DIVISION
STIPULATIONS:	NONWILDERNESS	FURTHER PLANNING-DEEP CREEK RESERVOIR NORTH	BOB MARSHALL WILDERNESS	SCAPEGOAT WILDERNESS	SILVER KING FALLS CREEK RARE II RECOMMENDED WILDERNESS	RENSHAW RARE II RECOMMENDED WILDERNESS	NONWILDERNESS**
Lease Status	Leased; Recommended to BLM	Leased; Recommended to BLM	Lease Applications; No recommendations have been made	Lease Applications; No recommendations have been made	Lease Applications; No recommendations have been made	Lease Applications; No recommendations have been made	Leased; Recommended to BLM
Acres	274,120	42,000	280,109	75,013	30,577	31,545	140,778
No-Surface Occupancy	98,683 (36%)	34,440(82%)					9,854 (7%)
Limited Surface Use	54,413 (20%)	Does Not Apply					1,400 (1%)
Timing Restrictions:							
Elk & Deer Winter Range	46,600 (17%)	17,220 (41%)					*22,666
Elk Calving	6,035 (2%)	3,360 (8%)					* 4,250
Sheep Lambing	5,217 (2%)	3,360 (8%)					
Migration Routes	11,800 (4%)	2,100 (5%)					* 6,816
Raptor Nesting	202 (4%)						30
Other	1,931 (1%)						* 1,113
Activity Coordination	100%	100%					

% indicates the total acres leased or recommended for leasing
* Additional restrictions are present, but acres are not available at this time.
** No lease recommendations have been made on the MWSA study areas.

MINERALS - METALLICS AND OTHER MINERALS

Estimated amounts of locatable minerals are not available, but the Jefferson Division of the Forest has a long history of silver, zinc, lead, copper, sapphire, and gold production. Production was mostly from small mines which produced intermittently until the 1950's.

Development work is now taking place on patented mining claims within the Forest. Within the next several years, an operation in the Barker-Hughsville area may be processing up to 300 tons per day of ore. Lead, zinc, silver, and trace amounts of gold would be produced. Exploration for low-grade molybdenum has been carried out on Upper Carpenter Creek for several years. In addition, a large increase in gold placer operations, suction dredge operations, and weekend miners is possible. Amateur gold panning and dredging as recreation will also probably increase in the future.

Common variety minerals (sand, gravel, and building stone) are found throughout the Forest. They are used by the Forest Service in construction projects and available under mineral permit to other Federal, State, County, and private individuals.

SOILS

As soils are a part of the physical environment, activities affecting soils affect the physical environment. Soils are generally affected by soil disturbance caused by human activity ranging from walking on the ground to building a road.

A landtype survey has been completed on the Lewis and Clark National Forest. The landtype survey is a soil survey using selected properties of landforms and climax vegetation (habitat types) to characterize mapping units. The inventory is a 3rd order soil survey as defined in Forest Service Manual 2550. The survey has not been correlated and publication within the National Cooperative Soil Survey has not been scheduled.

Slope angle is generally the greatest soil-related limitation on management activities. In general, the Rocky Mountain Division has the greatest soil and watershed sensitivities. The steepness of topography combined with extensive glacial deposits susceptible to mass failure result in naturally unstable watersheds. On the Jefferson Division, landforms and soils are predominantly stable with comparatively less rugged topography.

An estimated 2,000 acres are in need of control of management-caused erosion. All restoration needs will be inventoried by October 1, 1982, and all restoration completed by the year 2000 to control all management-caused erosion presently contributing to water pollution. No new areas of management-caused erosion are expected because of the implementation of "best management practices". Therefore, erosion is not significantly affected by any alternative.

LANDS

The social and economic environment may be affected by special land uses, acquisition of rights-of-way, and land adjustments.

Special Land Uses

National Forest land is generally available for occupancy if such occupancy is in the public interest. Occupancy takes place through issuance of special use permits. Over 380 special use permits have been issued on the Forest. Use of the Forest by special land use is increasing and will continue to do so.

Utility corridors are another land use of the Forest. A twin 500 KV powerline is planned from Colstrip to Hot Springs. A portion of this corridor would cross the Crazy Mountains. Also, U.S. Highway No. 89 divides the Little Belt Mountains and U.S. Highway 2 separates the Forest from Glacier National Park.

Right-of-Way Acquisitions

Lack of public access to the Forest and the intermingling of public and private lands within the Forest creates a variety of problems. The Forest lacks rights-of-way on many roads and most all trails that cross private land. Landowners often enjoy nearly exclusive use of public land through control of access. Recreationists often mistake unfenced private land for public land.

Demand for access to the Forest will increase as more people use the Forest and as more private landowners restrict access across their land. However, resistance to granting rights-of-way is likely to increase because of harrassment and vandalism.

Landownership Adjustments

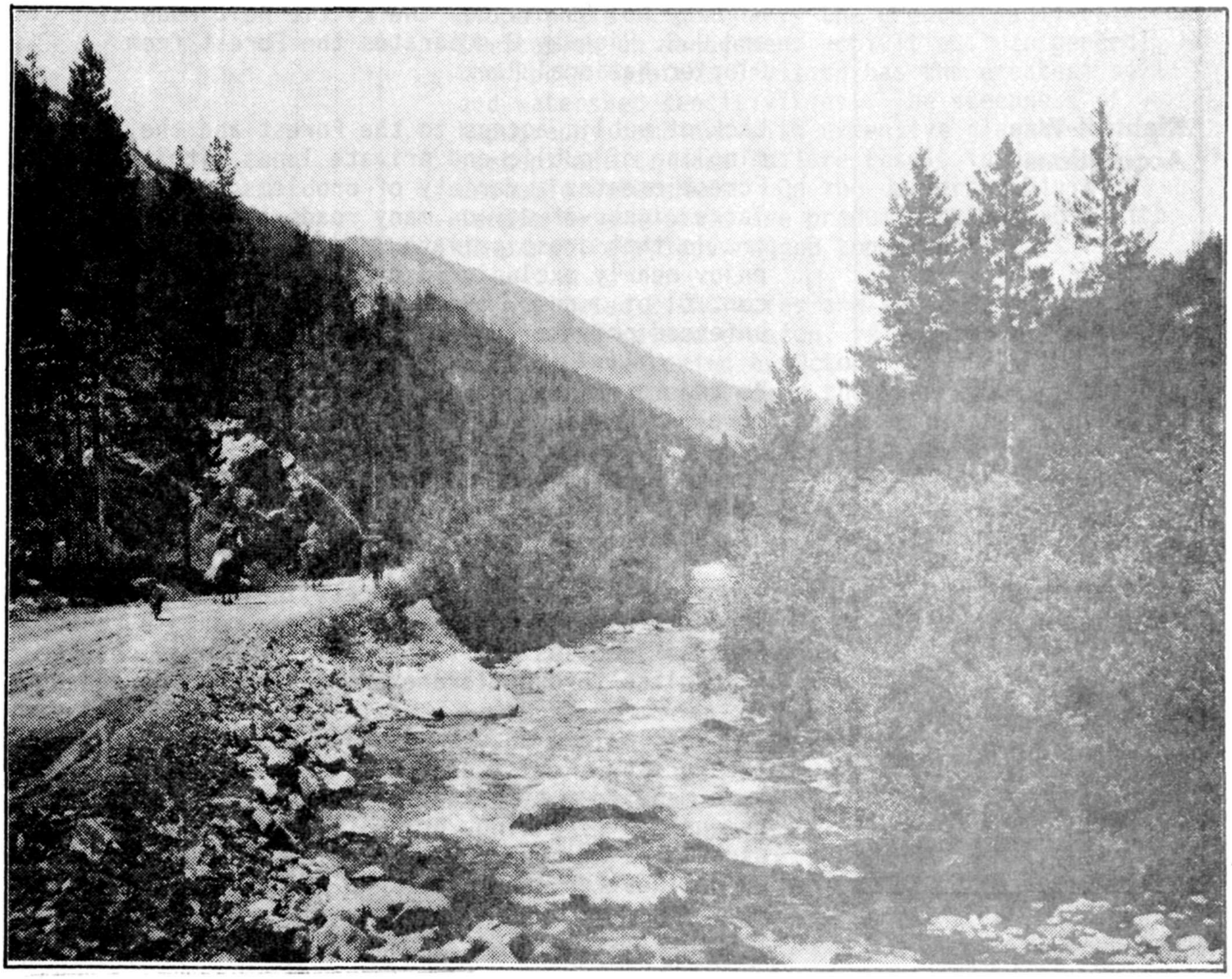
Landownership within the Forest includes private lands, mineral fractions, and lands owned by other Federal agencies and the State. Ownership changes take place through land exchange and fee purchases.

In 1967, a land adjustment plan was prepared for the Forest. Revisions were started and several were made from time to time, but were discontinued because of financing, priority, and need for a more usuable plan. The Forest Plan establishes specific guidelines for land ownership adjustments.

FACILITIES - ROADS AND TRAILS

Facilities, in this case, roads and trails, can affect the physical, biological, social, and economic environment of the Forest and surrounding communities.

The inventoried road system on the Forest consists of 155 miles of arterial roads, 643 miles of collector roads, and 597 miles of local roads. An estimated 600 miles of primitive roads are not on the inventory. Many other federal, state, and county roads also provide access to the Forest. The trails system on the Forest consists of 1,677 miles of managed trails and an unknown number of miles of non-system (non-managed) trails. The Forest has 7 National Recreation Trails.



ROAD SOUTHEAST OF NEIHART NOW HIGHWAY 89.

PROTECTION - FIRE MANAGEMENT

Fire and insect and disease activities affect the physical environment of the Forest and economic environment of the surrounding communities.

Wildfires burned an average of 492 acres a year on the Forest for the 1970-1979 period at a suppression cost of about $208,000 per year. Based on an upward trend in person-caused fires and an increase in hazardous fuels, wildfires can be expected to burn about 1,300 acres each year in the 1980-1989 decade. Theoretically, this trend would continue through the planning period until much of the lodgepole pine forest has been recycled back to a younger, more fire-resistant age class. Large fires in the thousands of acres can be expected during the planning period. Over 70 percent of the wildfire acreage burned between 1970 and 1979 has been in the lodgepole pine type in the Little Belt Mountains.

With few exceptions, prescribed fire has been limited to disposal of activity created fuels (primarily right-of-way and timber sale debris). Between 1,000 and 2,000 acres are prescribed burned for this purpose each year. Prescribed fire is also used for resource improvement, such as wildlife habitat. Increases in prescribed fire, therefore, can decrease future burned acreage and improve certain resources, such as wildlife habitat and domestic grazing.

PROTECTION - INSECT AND DISEASE

Nine insects and 20 diseases have been identified as major damaging agents to the trees of the Lewis and Clark National Forest.

The mountain pine beetle presents the most serious threat to lodgepole pine. Beetle populations periodically increase and kill most large diameter trees in a forest before subsiding. The Forest has about 250,000 acres that are highly susceptible to mountain pine beetle attacks (over 90 years in age).

Mountain pine beetle also attacks ponderosa pine, especially second growth as is found in the Little Snowies. Mountain pine beetle has infested about 10,000 acres of ponderosa pine, mainly on the Judith Ranger District.

The bark beetle attacks stands that are disturbed by blowdown, logging, or fire. The Forest has limited stands of spruce that are susceptible to the bark beetle. Western spruce budworm attacks spruce, Douglas fir, and subalpine fir. The larvae strips all current needles and some old needles from trees resulting in growth reduction. Continued defoliation results in tree mortality. Western spruce budworm has caused defoliation of nearly 35,000 acres of Douglas fir.

Root disease occurs extensively in Douglas fir and lodgepole pine on the Forest, especially in the Little Belt Mountains and on the Rocky Mountain Division. Groups of trees and scattered individual trees are killed by root disease. Volume impact is not known, but is probably substantial.

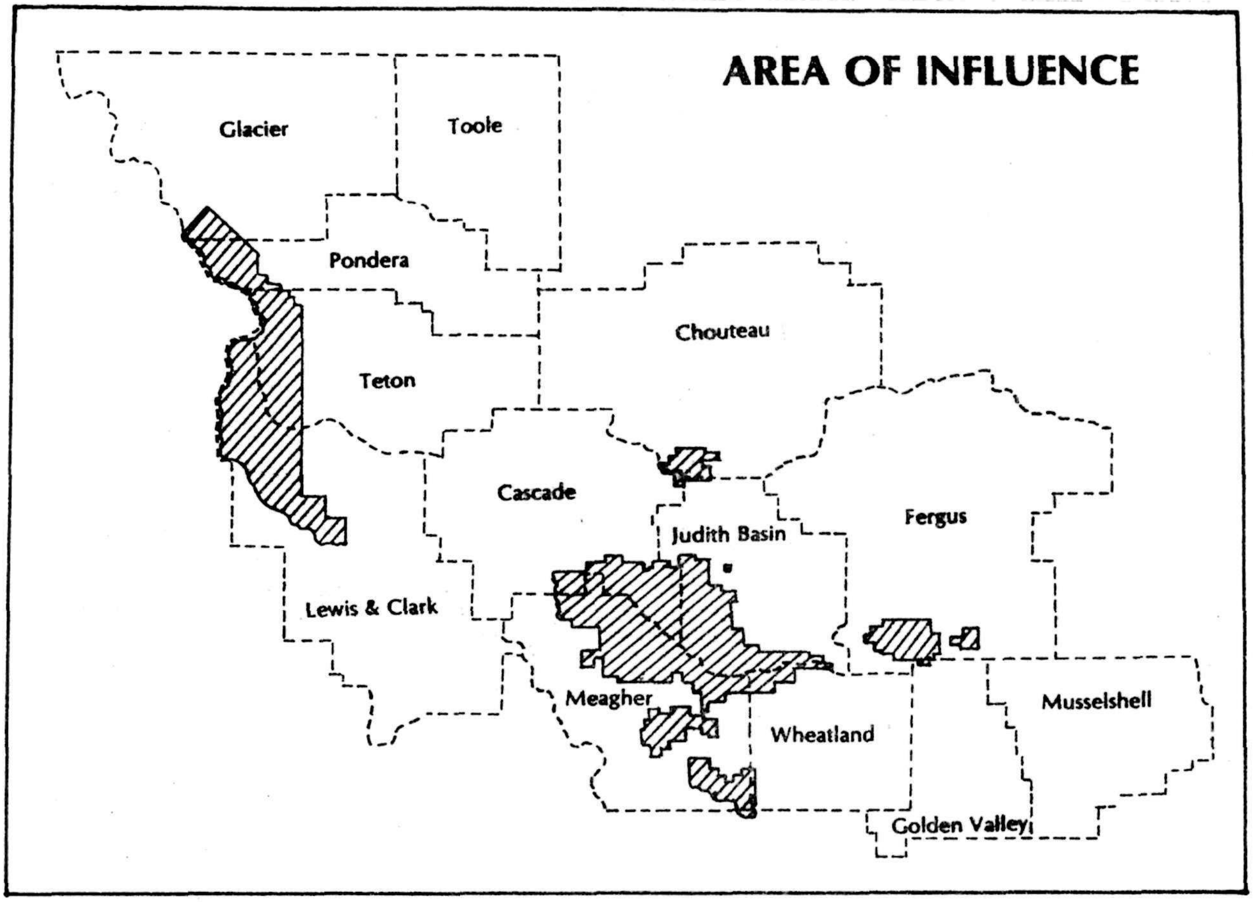
In addition to insects and disease, the Forest has over 20,000 acres of lodgepole pine and Douglas fir which has been damaged by red belt. The name "red belt" is applied to winter drying that occurs in zones or belts more or less following contour lines.

Wind also is a damaging agent that has affected significant acreages of the Forest by blowing over trees.

AREA OF INFLUENCE

While the Forest provides resources to the region and to the nation, the local area-of-influence includes twelve central Montana counties and a portion of another. This area-of-influence encompasses those people who depend on the Forest resources and who use it on a regular basis. Approximately 135,000 people live in this area. Major communities include Great Falls, Lewistown, Harlowton, White Sulphur Springs, Choteau, Stanford, and Browning. A variety of lifestyles exist throughout these counties.

In Cascade County, over 90 percent of the residents live within Great Falls while the other counties are very rural in nature. Like many National Forests, people living closest to the Forest often perceive it as a place to extract commodities, with non-market resources receiving secondary consideration. The more urban public views the recreational and scenic values of the Forest as its most precious resource.


AREA OF INFLUENCE
Glacier
Toole
Pondera
Chouteau
Teton
Cascade
Fergus
Judith Basin
Lewis & Clark
Meagher
Wheatland
Musselshell
Golden Valley

CURRENT SOCIAL AND ECONOMIC ENVIRONMENT

Population

During the 1970's, Montana's population grew by about 13 percent while the area-of-influence lost 4.3 percent. During the 1960's, all rural counties lost population due to farm consolidations, while the state's population remained static. During this period (1960's) the nations's population grew by 13 percent.

Employment and Income

While unemployment in the area is relatively low, job opportunities are also limited. Effective buying income ranges from almost $18,000 in Chouteau County to a low of $8,400 in Golden Valley County. The percentages of county residents classified as living in conditions of poverty range from 8.8 percent in Lewis and Clark County to a high of almost 30 percent in Glacier County.

Farming/ranching shows the highest percentage of wage and salary employment in all counties except Glacier, Cascade, and Lewis and Clark. The highest percentage in these counties, respectively, is in service industries, federal government, and state and local government.

Table 3.4 shows some of the major social/economic characteristics of these counties. Additional information can be found in the planning record, "Social Impact Assessment Baseline, 1980."

TABLE 3.4

COUNTY SOCIAL/ECONOMIC PROFILES

	1980 Population	% Change 1970-1980	% Change 1960-1970	% Unemployment 1978	Effective Buying Income 1978	Poverty Rate 1978	Major Wage & Salary Employment
COUNTY JEFFERSON DIVISION							
CASCADE	80,639	-1.4%	11.4%	6.8%	14,105	10.9%	federal government
CHOUTEAU	6,090	-5.9%	-14.0%	3.8%	17,936	11.6%	farming & ranching
JUDITH BASIN	2,636	-1.1%	-15.6%	10.%	10,703	15.2%	farming & ranching
FERGUS	13,052	3.5%	-11.1%	4.6%	11,801	14.9%	farming & ranching
GOLDEN VALLEY	1,017	9.2%	-23.%	4.9%	8,414	11.7%	farming & ranching
WHEATLAND	2,352	-7.0%	-16.7%	4.3%	12,033	16.3%	farming & ranching
MEAGHER	2,145	1.1%	-18.9%	4.8%	9,360	24.9%	farming& ranching
MUSSELSHELL	4,417	18.3%	-24.0%	4.7%	9,783	19.2%	farming & ranching
ROCKY MOUNTAIN DIVISION							
LEWIS & CLARK	43,053	29.4%	18.8%	5.3%	14,205	8.8%	state-local gov't
TOOLE	5,568	-4.6%	-3.5%	4.0%	17,492	11.6%	farming & ranching
TETON	6,485	6.0%	-19.2%	4.1%	12,873	12.0%	farming & ranching
PONDERA	6,735	1.9%	-15.7%	4.2%	15,543	18.2%	farming & ranching
GLACIER	9,662	-10.3%	-7.2%	9.7%	12,856	29.5%	Service Industries

SOCIAL VARIABLES

A vital component of the social base line data is the social variables or social traits of a community that can be measured and are judged to be potentially affected by activities of the Forest. Eight variables have been selected as important indicators of effect on local communities. These social variables are:

Sense of Control/ Self Sufficiency	-- The feeling that one has control over one's life direction; not subject to control by people outside the community.
Certainty/Uncertainty	-- The probability that future events can be counted on to permit a desired life direction.
Symbolic Meaning	-- The emotional and rational attachment one has on places and things on or from the Forest.
Emotional/Spiritual Renewal	-- The revival or re-establishment of certain emotional and/or spiritual levels as related to wildlands; a state of mind characterized by calmness, quietness, and tranquility; escape from excessive stimuli.
Lifestyles and Job Dependency	-- The use of Forest resources to maintain a way of living; the desire to maintain or enhance a way of living which may be financially dependent upon particular resource-related work.
Population Change and Crowding	-- The view that there are too few, enough, or too many people in an area.
Community Cohesion	-- The quality of adherence to a particular community cause; a sense of belonging that is associated with mutual community interests.
Landownership Patterns	-- The settlement with which people establish closeness or distance from one another; peoples' sense of appropriate private land use.

FUTURE SOCIAL AND ECONOMIC ENVIRONMENT

In order to estimate how different alternatives would socially and economically affect the environments of the area-of-influence, it is first necessary to estimate the condition which would be found if current management were to continue. Predictions are centered around the Montana Alternative Simulation System, which is a computerized economic/demographic model. The model predicts population growth for different counties, using economic growth as the primary determinant. Overall, the model predicts population increases for Montana's more urbanized counties while the smaller, more rural counties are predicted to have little economic expansion and to lose population. These population projectors are summarized in Table 3.5 at the end of this chapter.

Most of the counties within the Forest's area-of-influence are expected to grow little, if at all, in the future. Most rural communities are expected to: (1) grow in population at a slower rate than the State; (2) to make no population gains; or (3) to even lose people.

The area is heavily dependent upon the agricultural sector and this reliance will probably grow. Farming consolidations within the past twenty years have forced many farmers and ranchers to migrate to urban centers and have forced maturing youth to find employment within Montana cities. This trend is expected to continue.

Glacier County

Glacier County is expected to grow slowly in population within the next two decades. Oil and gas exploration, drilling, and development may boost these numbers more, but unless there are major discoveries, such as those just north of the area in Canada, no long-term significant population impacts would occur.

Toole and Pondera Counties

Toole County is also expected to grow slowly within the coming years and any growth will most likely be found within the county seat of Shelby. Further to the south, Pondera County is predicted to slowly drop in population. No new major economic activities are foreseen for the county and with continuing farm consolidations the population will drop as young adults find it necessary to seek employment opportunities elsewhere. Conrad, the county seat, could grow because of oil and gas activities on the Overthrust Belt, as it already has, but major discoveries and development would be necessary for any long-term effects.

Teton County

Although Teton County shows a predicted holding pattern for the 1980's and mild population drops thereafter, this county is probably the most susceptible to large population gains of any area within the Forest's area-of-influence. Presently, Choteau is stretching at the seams with about 150 oil and gas workers, but like other areas along the Rocky Mountain Front, major discoveries and development are needed for any long-term changes in the area's social structure. No separate population projections for the Augusta portion of Lewis and Clark County exist, but like Teton County, it will most likely grow very slowly, if at all, within the coming years barring any major oil and gas discoveries.

Cascade County

Cascade County is expected to grow by about 4 percent within the next five years and another 4.2 percent from 1985 to 1990, which is approximately the same growth rate as the State. The 1985-1990 rate could be a bit higher than this depending on the construction schedule of Resource 89 - a coal powered generator just to the east of Great Falls. Most of the growth within the county is expected to occur within Great Falls, although some of the surrounding communities will attract new resident commuters. The population of Great Falls has always been highly dependent on personnel changes at Malmstrom Air Force Base and this will remain true for the years ahead. Any decisions concerning missile systems or other aerospace systems in Montana will have a direct effect on the community. Also, while the community of Neihart is not expected to grow, the area around it could from an increase in summer homes.

Meagher, Wheatland, Golden Valley, and Musselshell Counties

Meagher, Wheatland, Golden Valley, and Musselshell Counties are not predicted to grow within the coming years. Despite years of attempts to lure small industries in these counties, they will most likely maintain their rural 'Old West' characteristics and low population densities.

Agriculturally oriented counties such as these can only maintain a fixed population if new employment is generated. More tourism, manufacturing, or mining are all possibilities for creating new employment and expanding population, but except for mining, these ventures are unlikely.

White Sulphur Springs is predicted to maintain its population in the years ahead, but if the economic situation should ever force the closure of the sawmill, this could reduce the community's population significantly. The small gains shown for Musselshell County are based on an increase in coal mining activities in its southern sections and possibly more Billings commuters also living on the southern edge of the county. In both cases, these changes would have little if any effect on the Forest.

Judith Basin and Fergus Counties

Judith Basin County's population is predicted to decline within the next two decades, although Stanford's population could remain steady because of its appeal as a retirement community. Fergus County is shown to remain steady until 1990 and then grow a bit from 1990 to the turn of the century. Lewistown, however, will most likely grow within the next ten years, contrary to these predictions. The community is of an intermediate size that can and already has attracted new industries. Its central location between Great Falls and Billings makes it a likely candidate for more retail and service industry jobs in the future. Also, oil and gas activities around the communities of Denton, Grass Range, Moore, and Winifred have recently boosted their populations and could continue to do so, depending upon whether major discoveries are made and how much development takes place.

Chouteau County

Chouteau County is very agriculturally-oriented and as such, its population is expected to slowly drop within the next decade. New hydroelectric power projects along the Missouri River could impact Fort Benton and Resource 89 is expected to have impacts on Geraldine.

TABLE 3.5

Montana County and Incorporated City and Town Population Projections, 1980-2000.

	1980	1985	1990	1995	2000
MONTANA	786690	822877	857438	892593	929189
GLACIER	10628	16723	10991	11266	11446
Browning	1226	1226	1259	1291	1325
Cutbank	3688	3820	3916	4010	4058
TOOLE	5559	5659	5659	5760	5760
Kevin	208	208	208	208	208
Shelby	3142	3195	3195	3246	3246
Sunburst	476	476	476	476	476
PONDERA	6731	6636	6444	6347	6252
Conrad	3074	2843	2755	2711	2667
Valier	640	640	597	597	597
TETON	6491	6491	6387	6284	6284
Choteau	1798	1798	1798	1742	1742
Dutton	359	359	359	359	359
Fairfield	650	650	650	650	650
CASCADE	80696	83762	87634	91208	94856
Belt	825	825	825	876	876
Cascade	773	824	875	875	926
Great Falls	70600	73353	76360	79491	82750
Neihart	91	91	91	91	91
MEAGHER	2154	2154	2154	2154	2154
White Sulphur Springs	1302	1302	1302	1302	1302
WHEATLAND	2359	2359	2359	2259	2259
Harlowton	1181	1181	1181	1136	1136
Judith Gap	213	213	213	213	213
GOLDEN VALLEY	1026	1026	913	913	913
Lavina	164	164	123	123	123
Ryegate	273	273	227	227	227
MUSSELSHELL	4428	4618	4618	4618	4618
Melstone	238	238	238	238	238
Roundup	2119	2203	2203	2203	2203
JUDITH BASIN	2646	2545	2334	2236	2135
Hobson	261	261	261	195	195
Stanford	595	595	529	529	529
FERGUS	13076	13076	13076	13167	13365
Denton	356	356	356	356	356
Grass Range	139	139	139	139	139
Lewistown	7104	7104	7104	7104	7104
Moore	229	229	229	229	229
Winifred	155	155	155	155	155
CHOUTEAU	6092	5994	5910	5715	5618
Big Sandy	835	835	835	779	779
Fort Benton	1693	1647	1647	1550	1550
Geraldine	305	305	305	305	305
LEWIS & CLARK					
Augusta Div. only	2234	no estimates	no estimates	no estimates	no estimates
TOTAL	144,120	151,043	148,209	151,927	155,660

Source: Montana Population Projections, 1980-2000. For Counties & Incorporated Cities and Towns. Environment Sciences Division, Montana Department of Health & Environmental Sciences, Helena, MT, 59601.

DEIS
SECTION 1
CHAPTER IV
ENVIRONMENTAL CONSEQUENCES

Overview

This chapter describes the major environmental consequences of implementing the Preferred Alternative (F) and other alternatives considered in detail. This chapter is the scientific and analytic basis for the comparison of the alternatives described in Chapter II. Environmental consequences are the result of activities scheduled to implement an alternative. The amount of activity varies by alternative and thus establishes the level of environmental effects. The alternatives include standards and guidelines designed to protect the long-term productivity of the lands.

The effects discussed may be beneficial or adverse, direct or indirect, short term or long term, and reversible or irreversible. Direct environmental effects occur at the same time and place as the initial action, whereas indirect effects occur later in time or are removed in distance from the action, but are still reasonably foreseeable. Also, any conflicts with other Federal and State agencies, State and local governments, and Indian tribes are discussed.

This chapter summarizes the overall consequences of each alternative and then the activities and associated consequences of the alternatives are discussed in more detail in terms of resource elements (e.g. range, wildlife, timber). Any mitigation measures are also discussed. Table 4.1 displays some of the outputs and physical, biological, social, and economic effects of the alternatives considered in detail. It is referenced throughout the chapter.

NON-SIGNIFICANT FACTORS

The following factors of the environment would be affected the same under any alternative in this environmental impact statement. Those factors are:

Cultural Resources

Cultural resources are protected equally under all alternatives.

Prime Farmlands

No prime farmlands are affected under any of the alternatives.

Wetlands

Wetlands are protected equally under all alternatives.

Minority, Economically Depressed, Elderly, Handicapped, Youth Groups, and Non-traditional Groups

These groups receive equal treatment and consideration under all alternatives.

Bald Eagle

While bald eagles are commonly observed on various portions of the Forest during fall and spring migrations, no active bald eagle nests are known on the Forest. None of the alternatives significantly affect this species.

Peregrine Falcon

Peregrine falcon are rarely observed on or near the Forest during seasonal migrations. No known active or historic nesting sites exist on the Forest. None of the alternatives will significantly affect this species.

Other factors or uses on the Forest will not significantly affect any environments of the Forest or the surrounding areas. Those factors or uses are:

Human Resource Programs

Human resource programs are the same under all alternatives and under current direction. No human resource program has a significant effect on the environment.

Land Line Location

The Forest has an ongoing land line location program; however, no alternative has a significant effect on the environment.

NON-SIGNIFICANT FACTORS

Land Status

Like land line location, land status activities do not have a significant effect on the environment.

Administrative Facilities

The Forest has a number of administrative facilities. Any actions involving these facilities do not have a significant effect on any of the environments.

Law Enforcement

The Forest relies on cooperative law enforcement agreements with counties to provide much of its law enforcement needs. Currently the Forest has 11 cooperative agreements. Law enforcement does not change under any alternative nor does it have a significant effect on the environment.

SUMMARY OF EFFECTS

SUMMARY OF EFFECTS

Current Plan

The Current Plan, with no increase in range and timber outputs, would not significantly affect the physical and biological environment. Roading of undeveloped lands would forego semi-primitive recreation opportunities although this roading would benefit those people who enjoy motorized recreation. Recommendations on oil and gas leases would include standard and special stipulations to protect surface resources.

Alternative A

Alternative A would cause the greatest change in the environment. Direct effects on the physical environment would include increased sedimentation and reduced water quality because of increased timber harvesting and grazing in the riparian zones. Wildlife would be adversely impacted, especially big game. A loss in wildlife population would indirectly affect the social and economic environment by reducing the amount and quality of recreation associated with wildlife, especially the economic benefits associated with big game hunting. Much of the undeveloped land would be roaded. The increased roading would benefit these people who enjoy motorized recreation. Foregone semi-primitive recreation opportunities would be a long term effect of this roading. An increase in timber and range production would have a beneficial effect on the surrounding communities by increasing income and employment in those communities. Alternative A would maximize the exploration and development of potential gas and oil reserves. It would have the greatest effect on the environment.

Alternative B

Alternative B would have significant effects on the biological, social, and economic environments. Big game and other wildlife populations would decrease. Along with this wildlife decrease would be a loss in recreation and hunting opportunities and the economic benefits from big game hunting. These decreases are greater than the Current Plan but less than Alternative A. The moderate increases in commodity production would benefit local communities through increased employment and income. Many semi-primitive recreation opportunities would be foregone because of the roading of undeveloped lands. Increased roading would benefit those people who enjoy motorized recreation. Alternative B would provide for a continuation of the current method by which oil and gas lease applications are processed.

SUMMARY OF EFFECTS

Alternative C

Alternative C would cause the least change in the physical and biological environment. The slight decrease in domestic livestock grazing would improve habitat for big game, especially on winter ranges. This decrease in grazing would have a small adverse impact on ranching communities. Other economic benefits to surrounding communities would not change significantly because commodities such as timber remain at slightly below the current level. Large areas would be retained for semi-primitive recreation which would benefit those people who enjoy this type of recreation. Alternative C would provide less opportunity for oil and gas exploration and development because semi-primitive recreation areas would be protected by non-surface occupancy stipulations.

Alternative D

Alternative D would have significant impacts on some biological and economic environments. The large increase in domestic grazing would benefit those people and communities that depend on ranching by increasing job opportunities and income. However, big game populations would decrease because of domestic grazing increases on important winter range. The decrease in big game populations would have adverse social and economic effects by decreasing recreation opportunities associated with wildlife, especially the economic benefits associated with big game hunting. Timber harvest would be slightly below current level. Alternative D would provide less opportunity for oil and gas exploration and development because semi-primitive recreation areas would be protected by non-surface occupancy stipulations.

Alternative E

Alternative E would have significant impacts on the Jefferson Division. Under this alternative, no regulated timber would be harvested in the Rocky Mountain Division. Effects on the Jefferson Division would be similar to Alternative A and similar to C on the Rocky Mountain Division.

Alternative F (Preferred)

Alternative F would have beneficial impacts on the surrounding communities by increasing employment and income through increased grazing and timber harvest. These increases would also provide a greater share of regional and national needs. However, these increases are not as great as in Alternatives A, B, and E. Big game populations and other wildlife populations would decrease slightly when compared with the Current Plan. These decreases would have little effect on the recreational opportunities associated with wildlife and the economic benefit of big game hunting. Most of the semi-primitive recreation opportunities would be retained, which would benefit those people who enjoy that type of recreation. While total acres in this setting increase, the semi-primitive recreation-visitor days are slightly lower than Current Plan because of the location of timber harvest acres in this alternative. Alternative F would provide for a continuation of the current method by which oil and gas lease applications are processed.

Table 4.1 displays some of the outputs and physical, biological, social, and economic effects of the alternatives considered in detail.

TABLE 4.1 RESOURCE PRODUCTION AND EFFECTS BY ALTERNATIVE

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)
CHANGE IN RECREATION SETTING BY 2030												
-Primitive (Wilderness)	Thousand Acres	0	+189	0	+189	0	0	0	+189	0	0	0
-Semi-Primitive	Thousand Acres	-127	-561	-561	-683	482	-75	-139	-590	-459	-34	-289
-Roaded Natural Appearing	Thousand Acres	+127	+372	+561	+494	482	+75	+139	+401	+459	+34	+289
-Rural	Thousand Acres	0	0	0	0	0	0	0	0	0	0	0
-Disturbance Campground Construction 1982-2030	Acres	0	36	36	0	0	18	36	6	6	36	36
VISUAL QUALITY OBJECTIVES												
-Preservation	Thousand Acres	448	637	448	637	448	448	448	637	448	452	448
-Retention	Thousand Acres	233	44	44	44	44	233	44	44	44	44	44
-Partial Retention	Thousand Acres	571	393	427	336	442	633	824	451	468	842	590
-Modification	Thousand Acres	591	770	924	826	909	529	527	711	883	505	761
WILDLIFE												
-Wildlife Habitat Improvement	Acre Equivalents											
1982-1990		1800	4680	5110	1600	680	5005	1705	2540	2630	2761	2761
2021-2030		1800	4560	5050	1510	660	5005	1645	2450	2490	2665	2665
-Threatened and Endangered Species Habitat Improvement												
1982-1990	Acre Equivalents	330	730	750	340	340	775	355	700	700	425	425
2021-2030		330	730	750	340	340	775	355	700	700	425	425

TABLE 4.1

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)
WILDLIFE (continued)												
-Fish Habitat Improvement	Acre Equivalents											
1982-1990		40	80	80	40	40	80	40	80	80	60	60
2021-2030		40	80	80	40	40	80	40	80	80	60	60
-Elk Population	Number											
1982-1990		8500	8500	8500	8500	500	8500	8500	8500	8500	8500	NA 1/
2021-2030		8500	8100	8000	8300	200	9300	7860	8200	8100	8400	NA
-Wolf Population	Number											
1982-1990		6	6	6	6	6	6	6	6	6	6	6
2021-2030		6	6	6	6	6	6	6	6	6	6	6
-Grizzly Bear Population	Number											
1982-1990		100	100	100	100	100	100	100	100	100	100	100
2021-2030		100	100	100	100	100	100	100	100	100	100	100
-Catchable Fish	Number											
1982-1990	(Thousands)	202	202	202	202	202	202	202	202	202	202	NA
2021-2030		202	167	174	186	186	208	170	192	192	190	NA
-Big Game Forage	Thousand											
1982-1990	AUMs	249	239	238	246	247	250	239	241	242	241	241
2021-2030		250	241	241	250	250	252	239	242	244	243	242
-Habitat for Old Growth Users	Acres											
1982-1990		512769	484612	482280	502696	498060	512341	512007	504529	502192	509294	506634
2021-2030		541124	489109	483906	515639	512162	563422	564064	503755	495741	542146	515114
-Habitat for Grass-Forb Users	Acres											
1982-1990		17035	26797	29016	21277	22881	17263	17926	21061	22321	18549	25524
2021-2030		31495	77292	82191	54380	57112	40135	39058	89156	96279	58363	66884
-Total Land Harvested in Undeveloped Areas by 2030	Acres											
Nonwinter range		25104	78961	113959	56508	66383	19502	20708	65801	86982	32994	53796
Winter range		4967	2586	1750	9602	10063	268	3641	1200	2085	4060	4568

1/ NOT AVAILABLE

TABLE 4.1

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)
WILDLIFE (continued)												
-Average Annual Prescribed Burning for Wildlife Habitat Improvement	Acres	175	770	813	226	211	655	215	500	463	370	370
-Elk Hunter Recreation	Thousand Hunter Days											
1982-1990		63.9	63.9	63.3	63.9	63.9	63.9	62.9	63.5	63.5	63.9	NA
2021-2030		63.9	50.4	51.6	56.3	55.3	71.9	56.9	55.0	53.0	60.1	NA
RANGE	Thousand AUMs											
1982-1990		72.3	73.0	73.0	73.0	73.0	71.8	73.0	72.8	72.8	72.8	72.8
2021-2030		72.3	86.4	87.5	81.4	81.5	71.4	89.9	84.4	84.7	79.2	79.2
-Ave. Annual Range Burning for Forage Production	Acres	1398	2284	2345	1564	1552	1324	2266	2165	2010	1839	1839
TIMBER												
-Programmed Sales Offered	Million Board Ft.											
1982-1990		13.0	20.0	20.0	14.0	14.0	12.5	12.5	14.0	14.0	14.0	15.5
2021-2030		13.0	41.0	41.0	23.7	23.7	12.5	12.5	33.1	34.0	24.0	26.6
-Acres Harvested	Acres											
1982-1990		1411	2094	2316	1531	1692	1433	1524	1520	1646	1581	2260
2021-2030		1228	3833	4134	3369	2850	1386	1172	3819	3998	2304	2042
-Long Term Sustained Yield	Million Board Ft.	14.3	41.1	43.5	32.6	33.6	18.3	16.0	34.6	38.8	25.4	26.4
-Growth of Long Term Sustained Yield at 2030	Percent	12	47	34	28	25	31	37	36	27	50	51
-Acres Available, Capable, Suitable	Acres	195533	473414	541678	452806	466071	209364	226762	433691	534186	286042	308872

TABLE 4.1

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)
TIMBER (continued)												
-Ave. Annual Silvicultural Burning for Composition and Stocking Control	Acres	0	94	110	115	204	0	0	100	150	70	84
-Ave. Annual Activity Fuel Treatment	Acres	1393	3143	3294	2367	2382	1497	1300	2503	2672	1697	2033
SOIL AND WATER												
-Sediment Yield	Tons											
1982-1990		2190	2620	4350	3190	3430	2190	3040	3160	3350	2190	2420
2021-2030		1840	5830	6210	5050	4280	1760	2066	5730	6000	2740	3040
-Water Quantity	Thousand Acre Feet											
1982-1990		1698	1698	1698	1698	1698	1698	1698	1698	1698	1698	1698
2021-2030		1700	1720	1720	1710	1710	1700	1700	1720	1720	1710	1710
MINERALS												
-Estimated Disturbance From Oil and Gas Occupancy	Acres	3830	3983	3753	3677	3715	3639	3907	4519	4481	4328	4328
-Land Available for Oil and Gas Occupancy Leasing	Thousand Acres	692	705	650	678	733	630	664	650	706	685	685
LANDS												
-Lands Required for Right-of-Way	Miles	99	199	199	183	183	168	148	169	169	70	76

TABLE 4.1

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F	ALT F
FACILITIES												
-Disturbance from Roading	Acres											
Arterial and Collector												
1982-1990		10.5	14.7	16.8	10.5	11.2	6.3	36.4	10.2	23.1	31.5	36.4
2021-2030		35.7	125.3	133.7	37.8	70.7	10.5	26.6	45.5	121.8	33.6	70.7
Local												
1982-1990		62.5	105.0	114.5	81.0	88.0	76.5	53.5	80.0	85.5	70.5	99.0
2021-2030		53.5	169.0	180.0	146.5	24.0	60.0	51.0	166.0	174.0	73.0	88.5
PROTECTION												
-Insect & Disease Relative Effects	Index 1/	.15	.26	.30	.24	.27	.14	.17	.24	.29	.20	.24
SOCIAL/ECONOMIC												
-Change in Employment	Person											
1982-1990		0	186	186	24	23	-1	1	16	13	23	34
2021-2030		0	588	588	254	228	-6	17	422	403	260	196
-Change in Income	Thousand Dollars											
1982-1990		0	1438	1438	297	266	9	10	226	287	26	472
2021-2030		0	6968	6968	3297	3226	-42	43	5648	5495	3305	2672
-Change in Population	People											
1982-1990		0	427	427	55	53	2	3	37	33	50	55
2021-2030		0	1352	1352	584	524	-15	40	970	927	600	665
-Change in Sense of Control/Self-Sufficiency	Index 2/											
Less Development		0	-2	-3	-2	-3	0	0	-2	-3	-1	-2
Nonwilderness		0	-2	+2	-2	+2	0	0	-2	+2	0	0
Wilderness		0	+2	-2	+2	-2	0	0	+2	-2	0	0
Timber		0	+2	+3	+1	+1	0	0	+1	+1	+1	+2

1/ Numbers relate to total available and capable acres for timber harvesting.

2/ Factors which reduce the expression of these social variables are shown with a (-) and factors which heighten the expression of these variables are shown with a (+). The numbers 1, 2, and 3 are a relative ranking; 1 is the least and 3 is the most. Factors which are neutral are represented by a (0). A discussion of these social variables is given on pg. 3-28.

TABLE 4.1

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2	ALT F (Prefer)	ALT F (Depart)
SOCIAL/ECONOMIC (continued)												
-Change in Certainty/ Uncertainty	Index											
Timber Industry		0	+3	+3	+1	+1	0	0	+2	+2	+1	+2
Ranching		0	+2	+2	+1	+1	-1	+3	+1	+1	+1	+1
-Change in Symbolic Meaning	Index											
Economic Maximum		0	+2	+3	+1	+2	-1	0	+1	+2	+1	+1
Nature/Refuge		0	-2	-3	-1	-2	+2	+1	-1	-2	-1	-1
-Change in Emotional/ Spiritual Renewal	Index											
Human Activity		0	-2	-3	-1	-2	+1	0	-1	-3	-1	-1
-Change in Lifestyle and Job Dependence	Index											
Grazing		0	+2	+2	+1	+1	-1	+3	+1	+1	+1	+1
Mining		0	+1	+1	0	0	-1	0	0	+1	0	0
Timber		0	+3	+3	+1	+1	0	0	+2	+2	+1	+2
-Change in Population and Crowding	Index											
White Sulphur Springs		0	+2	+2	+1	+1	0	0	+2	+2	+1	+1
Monarch-Neihart		0	-2	-2	-1	-1	0	0	-1	-1	-1	-1
-Change in Community Cohesion	Index											
White Sulphur Springs		0	+2	+2	+1	+1	0	0	+1	+1	+1	+1
Monarch-Neihart		0	-2	-2	-1	-1	0	0	-2	-2	+1	-1
Rural Residents		0	-3	-3	-2	-2	0	0	-3	-3	+1	-2
-Change in Landownership Patterns	Index											
White Sulphur Springs		0	-1	-1	0	0	0	0	-1	-1	0	0
Monarch-Neihart		0	-2	-2	0	0	0	0	-1	-1	0	0

RESOURCE CONSEQUENCES

DEVELOPED RECREATION

Activities included in the Developed Recreation Program are the maintenance and construction of campgrounds, picnic sites. All alternatives maintain existing sites, campground site construction varies from 0 to 36 acres. Table 4.1 displays the number of acres of campground construction by alternative.

Recreation

Overcrowding and site damage in some localized areas is possible in all alternatives after the year 2000 because use is expected to exceed total capacity. Alternative B, E, and Current Plan would provide the fewest facilities from 2000 to 2030. Alternatives A, D, and F (Preferred) provide the most facilities. The Forest could mitigate overcrowding by limiting use or by monitoring the actual use levels over time and if necessary, inventory possible additional sites.

Timber, Minerals, Livestock Grazing

The 36 acres of campground construction in Alternatives A, D, and F would limit timber harvest, mineral activities, and other developments in and around the recreation sites due to retaining the natural landscape. The proposed sites would also be unavailable for mineral, and oil and gas exploration and development. Livestock grazing is prohibited in developed sites.

Soil and Water

Soil erosion and water degradation may exist in localized areas where overcrowding occurs. Alternatives A, D, and F (Preferred) would decrease overcrowding by adding additional sites.

Social and Economic

Since none of the alternatives propose meeting the projected use level for developed recreation after 2000, this may provide incentive to the private sector to develop such facilities. Recreation construction would increase the employment of people and would require the purchase of materials and supplies. People would be needed (either Forest Service employees or private contractors) to maintain and manage the new sites.

The increase in campground sites in Alternatives A, D, and F (Preferred) provides greater opportunity for people to get away from the everyday stresses of an urban environment and enjoy the tranquility of the countryside.

DISPERSED RECREATION

The Dispersed Recreation Program essentially maintains an environment for outdoor recreation opportunities. Specific activities include signing, clean-up, public information services, and patrolling for public safety.

Table 4.1 summarizes the changes in recreation setting over 50 years. Dispersed recreation opportunities occur on primitive, semi-primitive, roaded natural appearing, and rural land areas.

Recreation

All alternatives, provide for decreases in semi-recreation opportunities and increases in roaded natural appearing recreation opportunities as unroaded areas are developed. The Preferred Alternative (F) has the least decrease, about 4 percent of the current opportunity.

The Preferred Alternative (F), the Current Plan, Alternative C, and Alternative D maintain the popular Tenderfoot, Deep Creek, Pilgrim Creek, lower Middle Fork/Lost Fork of the Judith, and Big Snowies in a semi-primitive recreation setting. Alternatives A-2, B-2, and E-2 would develop all these areas. Alternatives A-1, B-1, and E-1 would develop all areas except the Middle Fork Judith and Big Snowies which would be recommended for wilderness classification.

Alternatives A-2, B-1, B-2, E-1, and E-2 have the greatest increase in roaded natural appearing recreation opportunities. Alternative E-2 increases in roaded natural appearing opportunities would occur only on the Jefferson Division because no timber harvest is scheduled on the Rocky Mountain Division. Alternatives C, D, Current Plan, and F (Preferred) would keep the Forest much like it is today.

Wildlife

Increases in motorized recreation can affect wildlife, especially big game and T&E species. Road closures will help protect wildlife in critical habitat areas.

Timber

Less timber would be available for harvest in Alternative F (Preferred), Current Plan, Alternative C, and Alternative D because of maintaining more area in a semi-primitive condition.

Protection

Because recreation use levels are expected to increase over time, the number of person-caused fires could also increase. This adverse effect would be the same for all alternatives.

VISUAL RESOURCES

The Visual Resource Program determines how much the natural landscape may be modified in its appearance by various activities such as timber harvest and mining. Categories or objectives are preservation, retention, partial retention, and modification of the natural landscape. Objectives are determined in part by how visible areas are from population centers, major highways, roads, trails, campgrounds, and other recreation developments.

Table 4.1 shows the amount of acres within each of the four visual quality objectives.

Visual Quality

The natural landscape would be maintained to a greater degree under Alternatives A-1, C, D, F (Preferred), and Current Plan. The modification of the landscape would occur on more land in Alternatives A-2, B-1, B-2, E-1, and E-2. Short-term impacts from timber harvest and roads could be mitigated by scheduling treatments which would be spaced and timed so that adverse impacts are minimized.

Social and Economic

Even though most visual quality objectives can be met without prohibiting other resource activities, added care and cost is usually needed to meet the more restrictive objectives. These higher costs have the greatest effect on timber management activities including higher roading costs and higher logging costs. Alternatives A-1, A-2, E-1, and E-2 would have these higher costs because they harvest the most timber in visually sensitive zones.

WILDERNESS

The Wilderness Program provides for protection and preservation of large areas in their natural state. Activities include planning, administration and management to protect natural conditions, maintenance of signs and other facilities, and removal of garbage and litter. Primitive recreation takes place within classified wilderness. The existing wilderness opportunity can be maintained with no additional impacts on the environment.

Table 4.1 shows comparison of the acres in wilderness for each alternative. The Preferred Alternative (F) and Alternatives A-2, B-2, C, D, and E-2 do not recommend classification of the Middle Fork Judith and Big Snowies MWSA areas as wilderness. Alternatives A-1, B-1, and E-1 recommend that the Middle Fork Judith and Big Snowies MWSA areas be classified as wilderness. Under all alternatives the Renshaw and Silver King-Falls Creek areas are proposed for wilderness classification (RARE II).

Recreation

Primitive recreation is the greatest under Alternatives A-1, B-1, and E-1 where 637,000 acres would be wilderness. The other alternatives including the Current Plan provide primitive recreation opportunity on 448,000 acres.

A wilderness recommendation in the MWSA areas would make a small increase in the amount of recreation use because more out-of-state people would seek recreation in these areas.

Timber

Timber harvest opportunities would be foregone in the MWSA areas under Alternatives A-1, B-1, and E-1; however, the timber harvest levels do not decrease overall for the alternatives. In order to harvest this same level of timber in these alternatives, areas outside wilderness must be more intensively managed. This is particularly true of Alternative A-1.

Minerals

Access for mineral activities would be subject to restrictions under wilderness and could increase the costs to miners. Mineral potential is high in the Middle Fork Judith MWSA area.

Soil and Water

Under Alternatives A-1, B-1, and E-1 wilderness classification would protect watersheds and soils from resource activities on about 150,000 more acres than the other alternatives.

Protection

In Alternatives A-1, B-1, and E-1 the MWSA areas, Middle Fork Judith and Big Snowies, would be more susceptible to mountain pine beetle attacks because no regulated timber harvest would be permitted.

Prescribed fire in wilderness may seasonally adversely affect air quality, visibility, and odor throughout the local area.

Social and Economic

An increase of visitors to the MWSA areas due to the wilderness classification could help the local economy, outfitters, and other recreation-related businesses.

The social variables of sense of control and self sufficiency would be affected by the wilderness designation of the MWSA areas. Under Alternatives A-1, B-1, and E-1 the MWSA areas would be closed to motorized use. This would affect those people who enjoy motorized recreation, particularly in the Big Snowies where motorized use is common. The same alternatives would create the opposite feelings for those people wanting a pristine environment nearby, such as being able to "get away from it all," having plants and animals in their natural state for observation, hunting, fishing, backpacking, and hiking in an environment without the impacts of man, and having the knowledge that an undeveloped area is nearby.

See Section 2 of the DEIS for further analysis of the effects of wilderness.

WILDLIFE AND FISH

The Wildlife Management Program involves the maintenance and improvement of wildlife habitat. Elements of wildlife habitat include big game winter ranges, calving and lambing areas, migration routes, threatened and endangered species habitat, elk summer-fall ranges, raptor nesting sites, and signficant non-game habitat values. Activities under wildlife management include vegetation management for increasing the amount of shrubs, forbs, and grasses available to various species as well as protecting some sites as they exist for species depending upon an "old growth" environment. Maintaining security cover for some animals and minimizing the disturbances of human activity in important habitats are also wildlife management objectives.

The Fisheries Management Program concentrates on activities that occur on riparian zones. Objectives include minimizing sediment in streams, lakes, fish structure maintenance, and channel stabilization.

Table 4.1 lists wildlife, T&E species, and fish habitat improvement programs by alternative. Wolf, grizzly bear, elk, and catchable trout populations reflect habitat capacity. Big game forage is given in AUMs by alternative. The total lands harvested in undeveloped areas on both winter and nonwinter range by alternative are listed. In addition, habitat for old growth and grass-forb users is expressed in acres by alternative.

Recreation

Alternative C would increase recreation opportunities for viewing and hunting because of the increased big game populations. Alternatives A-1, A-2, B-1, B-2, E-1, and E-2 would significantly reduce this opportunity. Table 4.1 shows elk hunter days by alternative.

Range

Under Alternatives A-1, A-2, E-1, E-2, and D, range and big game values would often be in conflict. Most winter range is also primary grazing land for domestic livestock. If domestic grazing increased on winter ranges, special fencing, and/or intensive grazing management systems would be needed to maintain wildlife forage at a high level. Again, the effect of an intensive wildlife habitat program would be to increase the cost of grazing to ranchers. Also, degradation of hay stacks on private land may occur if the big game population is too high and/or a severe winter requires big game to move off the Forest in search of food.

T & E Species

Grizzly bear and gray wolf are found on the Rocky Mountain Division. Grizzly bear and gray wolf populations (T&E species) would not vary by alternative. The U.S. Fish and Wildlife Service recovery goal for grizzly bear is 81 bears. The Forest currently supports 100 animals. The recovery goal for gray wolf is 10. The Forest currently supports 4-8 wolves.

As livestock grazing increases on T&E species habitat in Alternatives A-1, A-2, B-1, B-2, D, and the Preferred Alternative (F), mitigation measures would be needed and ranching operations would have to absorb some of the costs. Mitigation measures are designed to lessen the effects of impacts on T&E species. These measures include timing restrictions to avoid grizzly bear and gray wolf use periods, and scheduling of concurrent activities to control human use levels over large areas. The potential for increased forage competition between cattle and grizzly bear can be reduced through the use of intensive livestock grazing systems and the use of structural improvements, as needed, to protect seasonally important habitats.

The number of livestock killed by gray wolf may increase as livestock number increases.

Wildlife and Fish Habitat Improvement

Alternatives A-1, A-2, and C have intensive wildlife habitat programs when compared to the other alternatives. Much of the habitat improvement program for Alternatives A-1 and A-2 is to help mitigate the high timber and grazing activities. Alternatives B-1, B-2, E-1, E-2, F (Preferred), and the Current Plan have moderate wildlife programs.

The wildlife program of Alternative C has the most beneficial effect on elk; increasing the population by 800 from 1982 to 2030. The other alternatives, with the exception of the Current Plan, result in a decrease of 100 to 700 elk over the 50-year period. The state goal for elk populations in the year 2000 is 13,650 animals which no alternative achieves.

Currently Alternative C supports an increase in catchable trout, but the rest of the alternatives (except Current Plan) result in a 10,000 - 35,000 trout decrease over 50 years.

Timber

If timber harvesting takes place on grizzly bear and gray wolf habitat, big game winter range areas, or on migration routes, timber harvest activities must be mitigated. Special attention would be needed for road management. These mitigations would increase the cost to timber harvesting operations. All alternatives except E-1 and E-2 harvest timber on T&E species habitat.

Minerals

Under all alternatives, habitat management for T&E species would affect oil and gas activities by requiring these activities to follow special guidelines. These requirements increase the cost of the mining operations and in some cases preclude the activity altogether.

Relationship with Private Land

Overall, the total carrying capacity of winter-spring ranges is the limiting factor on elk populations. Forest lands supply an estimated 50 percent of the forage during winter-spring periods. During severe winters, the amount of forage available for elk decrease significantly forcing more of the total winter-spring use on adjacent Federal, State, and private lands. Alternative C, which would increase the elk population, would also affect these adjacent lands.

Social and Economic

The wildlife and fish management program has both beneficial and adverse effects upon the economy of the State and surrounding communities. Favorable economic effects of intensive wildlife management would be an increase in recreation opportunity, visitors to the area, and thus, an indirect effect of increasing income to the local economies. Alternative C would provide the most benefit.

A direct economic effect of large big game populations is license fee receipts to the State. A major source of revenue to the Montana Department of Fish, Wildlife, and Parks is licenses sold to 17,000 out-of-state hunters. At $275 per license, total revenue would equal $4.7 million dollars.

Wildlife habitat programs can have an adverse economic impact on timber harvesting, ranching, and minerals, oil, and gas activities. The cost of doing business can increase as specific measures and structures are needed to mitigate adverse effects on T&E species, big game populations, and other wildlife and fish.

Range

The Range Management Program provides for efficient livestock grazing on forest and rangelands commensurate with other needs. Activities include management of range permits, monitoring range use, and maintaining and constructing range improvements such as fences and water developments.

Table 4.1 shows the acres grazed by domestic livestock for each alternative. Also shown is the average annual prescribed range burning for forage production.

All alternatives, except C, provide an increase in livestock grazing. Alternative C would decrease livestock grazing slightly. Livestock grazing increases for Alternatives E-1 and E-2 would occur on the Jefferson Division.

Range Improvement

Burning to change the vegetation to an early stage would have a long term benefit for the range resource by maintaining a high level of forage production. Alternatives A-1, A-2, and D burn the most acres by prescription for range management.

Construction of fences and water developments improve the distribution of livestock, provide additional grazing use, reduce overused areas, and improve the vigor and production of forage.

Recreation

Some impacts of grazing include conflicts with recreationists, especially in heavily used recreation areas. Alternatives with the highest output of grazing, A-1, A-2, and D, would create the most conflict. Fences, gates, and cattleguards can minimize conflicts with recreational use.

Wildlife and Fish

Livestock grazing has an adverse effect on big game; primarily where grazing occurs on big game winter ranges. There may be a long term effect by reducing the carrying capacity for big game animals because the amount of winter range is a limiting factor on big game populations. Alternatives A-1, A-2, and D affect the most acres of elk winter range. Adverse effects on elk populations could also occur on summer ranges where social competition between livestock and elk is a problem. The opportunity to effectively mitigate adverse impacts upon big game become lessen domestic livestock allocations increase.

Grizzly bear can be adversely affected when they have to compete with livestock for desirable forage. Alternative D would increase livestock grazing significantly on the Rocky Mountain Division. Alternatives A-1, A-2, B-1, B-2, and the Preferred Alternative (F) would also increase livestock grazing on the Rocky Mountain Division. Grazing under Alternative C, E-1, and E-2 would not increase on the Division.

The use of intensive livestock grazing systems can reduce forage competion. Mitigation measures include timing restrictions to avoid primary grizzly bear use periods, the scheduling of concurrent activities to control human use levels over large areas, and the use of structural improvements, as needed, to protect seasonally important habitats. Although effective coordination is expected to minimize both direct and indirect impacts, mitigation measures would not eliminate all the projected adverse effects.

Timber

All alternatives include livestock grazing of transitory range. Assuming forage utilization is not excessive, livestock grazing would not adversely affect timber production in all alternatives.

Burning of trees encroaching into grasslands should not have a significant effect on future timber production because the areas are marginal timber producing sites.

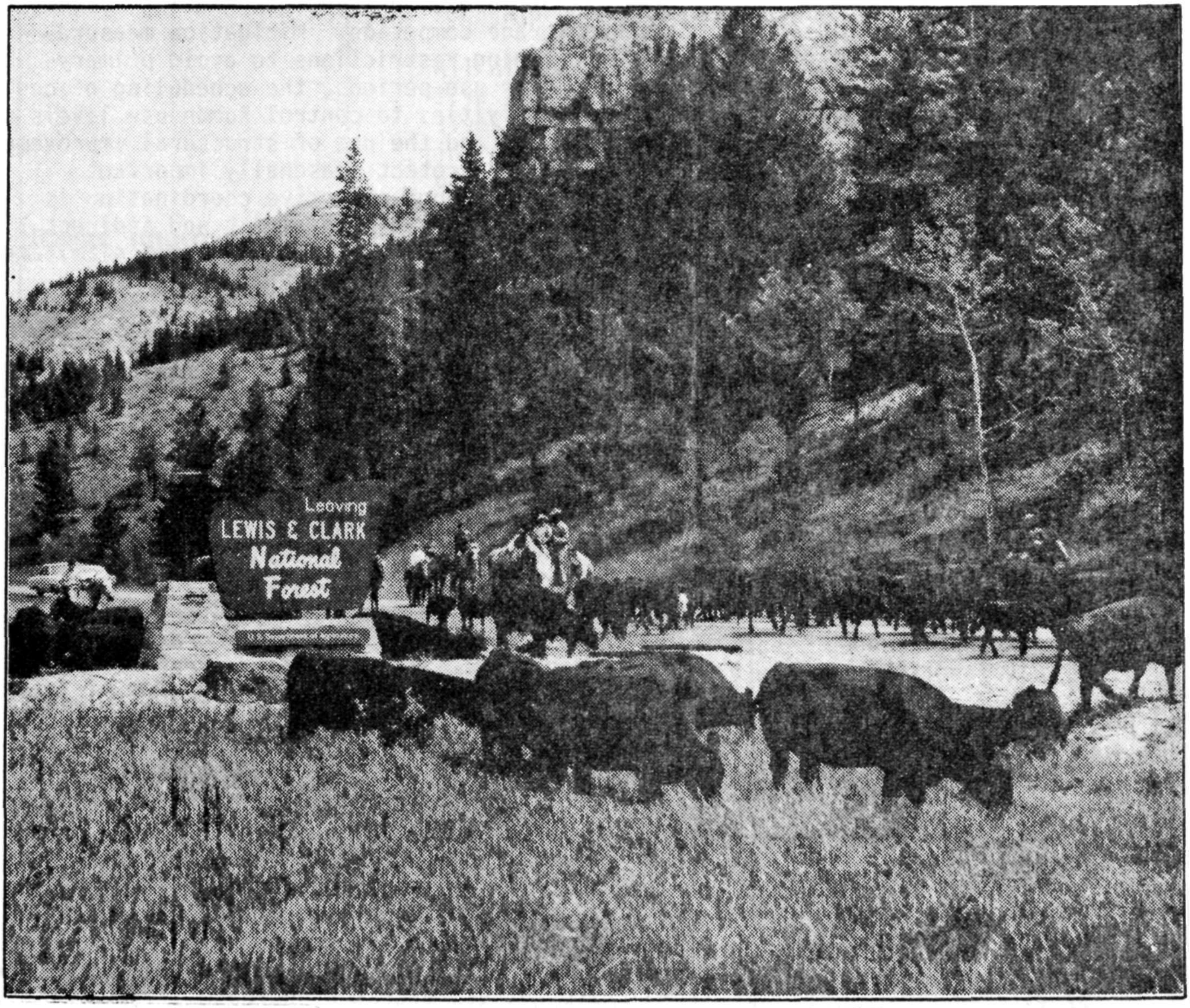
Soil and Water

All alternatives except for the Current Plan and Alternative C increase livestock grazing over a 50-year period. Increase in sedimentation and a decrease in water quality could occur. Mitigation measures are listed in the management practices, standards, and guidelines for grazing in riparian zones. Activities include distribution of livestock through the placement of salt and the construction of fences.

Social and Economic

While the percentage of grazing provided by the Forest is not large in comparison with total grazing, the increases in grazing on the Forest would have some economic benefit to the local area. All alternatives except C increase livestock grazing to provide more beef, lamb, and wool to the consumer. This would generate increases in income to the local level livestock industry and increase grazing receipts to the U.S. Treasury.

The increase in grazing opportunity over time for all alternatives except Alternative C have a beneficial effect upon the ranching operations by assuring a constant supply of land for grazing. The feeling of certainty about future supply will enhance lifestyles and grazing opportunties for ranchers in all alternatives except C.



ANGUS CATTLE ENTERING THE FOREST
NORTH OF MONARCH.

TIMBER

The Timber Management Program ensures the growth and use of the timber resource for the benefit of the Nation. Activities include the scheduling of timber harvest, administration of timber sales, timber stand improvements such as thinning, and the reforestation of harvest sites through site preparation and planting. Road construction and maintenance, an activity closely associated with timber harvest, is discussed later in the chapter under Facilities. Table 4.1 gives the harvest volumes, the acres harvested, the long term sustained yield, growth of long term sustained yield, and acres available, capable, and suitable for timber management.

A small program is proposed under all alternatives except E for the Rocky Mountain Division. Harvest levels would vary from .7 million board feet for alternatives C and D to 1.5 million board feet for the Preferred Alternative (F). This program would provide the opportunity to manage vegetation through timber harvest to improve wildlife habitat and diversity and to deal with insect and disease problems.

The Timber Management Program can have an overall effect on the productivity of the timber resource. This productivity can be expressed as the percent of growth of LTSY (long term sustained yield). The percent of growth of LTSY varies from 12 percent (Current Plan) to 50 percent (Alternative F). The "Revised President's Statement of Policy" calls for commercial timber lands to have been brought to and maintained at, where possible, 90 percent of LTSY by 2030 consistent with the provisions of NFMA. The timber program cannot increase the percentage beyond 50 percent because of the age structure of the Forest. See Chapter II, Timber, for further discussion.

Silvilcultural Practices

The volume for the programmed sales offered varies according to the level of management intensity and the acres allocated to timber management. Volume is increased over time as a result of silvicultural practices such as planting and precommercial thinning.

Natural regeneration is abundant on most harvest areas. Dry forest sites do require about 15 percent of the site to be hand planted.

Alternatives A-1, A-2, and E-1, have a high management intensity and would require large precommercial thinning programs. Alternatives A-1 and E-1 would require higher amounts of precommercial thinning because the MWSA areas are designated for wilderness and unavailable for timber harvest. Alternatives B-1, B-2, C, D, and the Preferred Alternative (F) would have small precommercial thinning programs to sustain timber harvest at their level of production.

Recreation

Existing recreation settings are changed by developments associated with timber management such as timber harvest and road construction. Alternatives A-1, A-2, B-1, B-2, E-1, and E-2 would develop the most land for roaded natural appearing recreation setting. Alternatives C, D, and Preferred Alternative (F) would maintain large areas in a semi-primitive recreation setting.

Visual Quality

Timber management activities have significant effects on visual quality. Although the impacts of timber management are generally short term, the immediate change to the existing landscape is undesirable to many Forest visitors. The establishment of visual quality objectives provides the method for carrying out timber management and other activities while protecting the visual resource. Treatments would be spaced and timed so that adverse visual impacts are minimized. Alternatives A-1, A-2, E-1, and E-2 could adversely affect driving for pleasure because of a decrease in visual quality resulting from increased timber harvest in visually sensitive zones.

Wildlife and Fish

Timber harvest provides wildlife forage and habitat diversity by creating different age classes of trees. Timber harvesting reduces hiding and thermal cover primarily impacting big game fall ranges. As roads are constructed and timber cover is removed, habitat security for elk is reduced. This in turn reduces hunting opportunity. Elk hunting opportunity is shown in Table 4.1. These effects would be the greatest under Alternatives A-1, A-2, B-1, B-2, E-1, and E-2. Human use, equipment operation, and other noises associated with timber harvesting activities could have a short term adverse effect on the distribution of wildlife.

Major indirect impacts upon grizzlies would result from high levels of human use associated with timber harvest activities. The short term effects of increased human use would displace grizzly bears in occupied grizzly bear habitat.

The food source for the gray wolf could be indirectly benefited by timber harvesting which provides more transitory forage for their major prey: deer and elk. The gray wolf, like the grizzly bear, would be adversely impacted by human use associated with timber harvesting. Timber harvesting would have little effect on fish populations. Effects of increased sedimentation levels in the streams from roads constructed for timber harvesting is discussed under Facilities.

Diversity

All alternatives would provide adequate old growth and grass/forb stage habitat to sustain viable populations of dependent wildlife species.

Fewer acres would be maintained as old growth under Alternatives A-1, A-2, B-1, and B-2 which could cause some wildlife species to migrate. Habitat for wildlife species using the grass/forb stage would increase under these same alternatives.

All alternatives (except E-1 and E-2) increase timber harvest on grizzly bear habitats. Timber harvest may increase transitory forage production on important grizzly bear feeding sites if properly planned and carried out.

Range

Timber harvesting creates additional transitory forage for wildlife and domestic livestock. Alternatives A-1, A-2, E-1, and E-2 would create the highest levels of transitory range for domestic livestock. However, transitory range is a minor component of the entire forage resource on the Forest. One adverse effect on range is the removal of natural barriers as a result of timber harvesting. This is mitigated through fence construction.

Soil and Water

Alternatives A-1, A-2, E-1, and E-2 have the highest levels of timber harvest. Water yield from any one of these alternatives is less than a 2 percent increase per decade. This change is less than the annual variation in water yield due to natural factors and would not affect stream channel morphology. Soil disturbed by timber harvest can erode away. Mitigation measures to prevent soil erosion would include directional felling of trees, waterbaring on skid trails, and seeding landings.

Air Quality

Air quality would be affected a few days during the fall and spring as a result of prescribed fires for disposal of activity fuels and composition and stocking control (see Table 4.1). Alternatives A-1, A-2, B-1, B-2, E-1, E-2, and the Preferred Alternative (F) would increase the levels of particulate matter over the Current Plan as a result of fuel disposal and composition and stocking control.

Protection

Timber harvesting would be used to control insects and disease, particularly in Alternatives A-1, A-2, B-1, B-2, E-1, and E-2. Under these alternatives, the Forest would be less susceptible to mountain pine beetle attacks because more acres are in a variety of age classes created through timber manage-ment activities. Alternative C and Current Plan provide for the least protection from mountain pine beetle infestation. Table 4.1 shows the relative effects of insects and disease on the Forest by alternative.

Accumulation of fuels results from timber harvesting and increases the risk of forest fires. This effect would be mitigated under all alternatives by piling and burning of the slash.

Social and Economic

For those economically dependent on timber harvesting, Alternatives A-1, A-2, E-1, E-2, B-1, B-2, and F would enhance lifestyle and job opportunity.

Increases in the level of timber harvest would help meet the demand for wood products and help stabilize timber dependent communities. Communities are expected to become more dependent upon National Forest timber supplies as private land is harvested and some of it is converted to rangeland. Alternatives A-1, A-2, E-1, and E-2 provide the highest output in timber and associated increases in payroll employment and county and Federal receipts.

The most dramatic population changes would occur in Alternatives A-1 and A-2. Increasing harvesting to 21 million board feet by 1990 would increase total primary employment by approximately 34 jobs, and produce a total population gain of 300 people.

By 2030, harvesting of 41 million board feet under Alternatives A-1 and A-2 would increase total primary employment by 241 jobs, secondary employment by 136 jobs, and produce a total population gain of almost 1,000 people.

White Sulphur Springs would receive at least two-thirds of the changes in employment and population. The community's 1980 population was about 1,300 people. By 1990 under the Current Plan, its population is projected to remain the same. However, the population by 2030 is projected to increase to 1,560, a 20 percent increase.

Much of the remaining employment and population changes would probably be felt within the Monarch-Neihart area. Increases under Alternatives A-1, A-2, B-1, B-2, E-1, and E-2 could lead to perceived crowded conditions and clashes in lifestyles between some groups within the Monarch-Neihart communities (see social/economic variables in Table 4.1).

The economic benefits generated under different alternatives would help to increase the sense of control, self sufficiency, and cohesion within timber dependent communities such as White Sulphur Springs by producing a more optimistic economic outlook which could increase community spirit. Alternatives that increase harvesting would relieve the uncertainty for the timber industry in that a good supply of Forest timber would be available.

All alternatives except E-1 and E-2 would harvest timber on the Blackfeet Indian Treaty lands on the Rocky Mountain District. Increased access into the area would provide greater opportunity to the Blackfeet for hunting, fishing, wood gathering, and processing. However, some Blackfeet may not like to see the area changed from its natural state.

Favorable social effects of increased roading include recreationists who enjoy motorized use, although this would depend on the road management for the area. Timber harvest would adversely affect those people who enjoy an unroaded recreation setting and a natural landscape.

MINERALS
OIL AND GAS

The Minerals Program administers mineral exploration and development on National Forest System lands compatible with other resource values. Oil and gas exploration and development is carried out by private companies under a land leasing program. The BLM (Bureau of Land Management) is responsible for oil and gas leasing. The Forest Service reviews lease applications and recommends to the BLM what National Forest lands should be leased and what controls (stipulations) are needed to protect surface values and uses.

Process and Activities

The process and the activities that could be associated with each of the steps are listed below.

PROCESS STEPS	ACTIVITIES
Leasing	Environmental analysis and recommendation
Preliminary Exploration	Geologic mapping, seismic surveys, such as surface explosives, drilling, and vibroseis Roading and off-road vehicle travel
Exploratory Drilling	Drilling of core samples and/or wells, roading, and construction of drill pad
Field Development, Production, and Reclamation	Drilling wells, roading, and construction of drill pad, sweetening plants, storage of tanks, pipelines, and other facilities

Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling for any given lease block (a collection of leases held by one company). The probability of occurrence for a particular activity sharply diminishes with each step with the exception of reclamation which occurs if a well is drilled or a field is developed.

Most oil and gas activity will take place on the Rocky Mountain Division. The Rocky Mountain Division has the greatest and most extensive potential for discovery of oil and gas on the Forest. Examination of oil and gas fields in similar geologic settings to those on the Division suggests that if producing fields are established they are likely to be between 3 and 30 square miles in extent.

In order to convey what such fields may look like, maps of the Rocky Mountain Division are displayed in the Proposed Forest Plan showing potential arterial road corridors, occupancy opportunities, and most likely field size. In areas where surface occupancy is allowed, there are additional restrictions on activity to protect other surface resources and uses.

The Jefferson Division has low oil and gas potential and is not expected to be significantly affected.

Table 4.1 lists the lands available for oil and gas occupancy leasing and estimated acres disturbed from oil and gas occupancy by alternative.

Alternatives A-1 and A-2 would maximize the exploration and development of potential gas and oil reserves. It would also have the greatest effect on the environment as described in this section. Alternatives C and D would provide less opportunity for oil and gas exploration and development than Alternatives A-1 and A-2 because semi-primitive recreation areas would be protected by no-surface occupancy stipulations. The Preferred Alternative (F), Alternatives B-1, B-2, E-1, E-2, and Current Plan would provide for a continuation of the current way oil and gas lease applications are processed. These alternatives provide for a reasonable opportunity for oil and gas exploration and development while protecting surface value.

Recreation

Oil and gas activities would affect the quality of the recreation setting. The effect would be particularly noticeable in semi-primitive settings under all alternatives except C and D where the introduction of roads and motorized use would be distracting. Campgrounds, resorts, summer homes, ski areas, and other permitted recreation uses will be protected under all alternatives by non-occupancy stipulations and restrictions on occupancy in the surrounding area to preserve the setting. Some business operations such as outfitters and guides could be adversely affected by the disruption of the semi-primitive recreation setting by oil and gas activity.

Noise from helicopters transporting personnel and equipment takes place during the portable seismic activity. Also, when surface charges are detonated, the noise from the blast may be audible for several miles depending on the terrain and location of the operation.

User conflict on roads may take place between the general public, log hauling traffic, and oil and gas exploration traffic.

Visual Quality

Under all alternatives where pad site and road construction is allowed, the visual quality may be temporarily lowered due to the changes in landscape color and shape.

Wilderness

Under all alternatives oil and gas in wilderness and recommended wilderness areas will be held in abeyance until a separate environmental analysis is completed.

Wildlife and Fish

Human activity, blasting, and helicopter use may affect wildlife habitat use patterns. Increased human activity has the greatest potential adverse effect. Potential effects due to increased human activity include; illegal poaching, displacement of animals from their historically used seasonal ranges, and in the case of grizzly and wolf, man to animal confrontations which may lead to the killing or relocation of the animal.

Big Game

The timing and location of surface occupancy for preliminary exploration and exploratory drilling activities in relation to key habitat use patterns would determine the significance of disturbances or displacement. The potential conflict would be during use periods on restricted key habitat, such as big game concentration areas and migration routes. Direct mortality from seismic activity is very unlikely. Wildlife habitat loss or degradation would be negligible during preliminary exploration.

The sensitivity periods for big game are as follows:

Elk and Deer winter range	12/1 to 4/30
Elk calving areas	5/1 to 6/30
Elk migration routes	Designated by District Ranger
Bighorn Sheep winter range	12/1 to 4/30
Bighorn Sheep lambing areas	4/15 to 6/30
Bighorn Sheep migration routes	Designated by District Ranger
Mountain Goat winter range	12/1 to 4/30
Mountain Goat kidding areas	5/1 to 6/30
Moose winter range	12/1 to 4/30
Raptor nest sites	Designated by District Ranger

Effects on wildlife would include possible destruction of other habitat by road, drill pad, and other facility construction. The destruction of habitat could be significant if the habitat is important and limited.

All alternatives have mitigating measures to protect fish habitat by limiting road construction in riparian zones and seasonal restrictions on in-stream entry.

T & E Species

The effect associated with preliminary exploration activities upon the grizzly bear and gray wolf would be the increased potential for short term displacement from key seasonal habitats.

The sensitive periods to human activity for grizzly bear are as follows:

Grizzly bear spring range	4/01 to 6/30
Grizzly bear denning habitat	10/5 to 4/01

The inclusion of occupancy restrictions and the scheduling of seismic activity to achieve spacing in time and location would minimize the disturbance to grizzly bear and wolves. The implementation of the firearm restrictions would minimize the potential for grizzly and wolf mortality to occur from human confrontations.

Vegetation

Under all alternatives, the use of surface explosives, construction and drill pads, and roads would result in destruction of existing vegetation. The amount of vegetation disturbed by oil and gas activities would be relatively small areas and should have little effect on native plant communities. Disturbed areas would be seeded with grass and native shrubs. Reforestation of reclaimed roads and drill pads would take place naturally.

Soil and Water

Impacts of preliminary exploration on soil varies in severity and amount depending on the method of seismic survey being used and the season of the year in which the activity occurs. Under all alternatives, soil compaction would occur from off-road vehicle travel. This can be avoided by limiting off-road travel to dry periods during the summer and fall and by avoiding compaction-prone soils.

The use of explosives (particularly prima cord), shallow drilling, construction of roads, drill pads, and other facilities would result in soil disturbance and would require reclamation measures to prevent erosion and increased sediment in streams.

All alternatives have mitigating measures for riparian zones, floodplains, and wetlands because they have values which are especially sensitive to disturbance.

Air Quality

The short term effects from oil and gas activities on air quality are dust from trucks and other equipment as they traverse the roads, and a cloud of smoke and dust that dissipates into the air from each blast when explosives are used on the surface.

Emissions of H_2S (hydrogen sulfide) or "sour gas" could occur. Should "sour gas" be produced, gas sweetening plants would need to be built to remove the sulfur.

SOCIAL/ECONOMIC EFFECTS

Some of the greatest social and economic effects from Forest resource activities in the future will come from oil and gas development. Most of these activities are expected to take place in the Rocky Mountain Division in three general areas: the Badger-Two Medicine area, the Blackleaf area, and in the Sun River area. Activities in the Badger-Two Medicine area would most likely affect the Blackfeet Reservation, communities of East Glacier, and to a lesser extent, Browning. Activities in the Blackleaf area would affect the community of Choteau and activities in the Sun River area would affect Augusta.

The effects are summarized in Table 4.2 according to a "most probable" or "large discovery" scenario. Oil and gas activities outside of the Forest are now having social-economic effects within local communities. What happens on the Forest is highly dependent upon discoveries on private lands.

TABLE 4.2

"Most Probable" (10 wells) (2 deep drill rigs)	Development	Production
Number of Employees	50	5
Number of Employees Who Are Local Hire (Including Commuter)	10	3
Duration	2-4 years	20 years
Annual Payrolls (1978 rate)	$1,000,000	$85,000
Number of Secondary Jobs Generated	56	5
Annual Payroll From Secondary Jobs - (1978 rate)	$610,000	$55,000
Total Immigration (Excludes Local & Commuters)	110	12
Housing Units	50	4
New Students:		
Elementary	15	2
Secondary	6	1

"Large Discovery" (21 wells) (3 deep drillings)	Development	Production	Gas Processing Facility Construction	Gas Processing Facility Maintenance
Number of Employees	75	7	50	20
Number of Local Hire	8	4	25	10
Duration	2-4 years	30 years	8 months	30 years
Annual Payroll	$1,500,000	$120,000	$675,000	$290,000
Secondary Jobs	84	5	56*	20*
Secondary Jobs Payroll	$ 900,000	$ 53,000	$560,000*	$219,000*
Total Immigration	165	18	85	28
Housing	75	6	37	12
New Students:				
Elementary	22	3	12	5
Secondary	9	2	5	2

*Large temporary construction crews may not generate this much secondary employment-income.
Source of Calculations: Social & Economic Assessment of O&G Activities - Information & Guidelines. Lambert Wenner, M&G, USFS, R-1, 1981.

SOCIAL AND ECONOMIC AUGUSTA

Under the "most probable" scenario, over a 2 to 4 year period, there would be a total in-migration of 110 people, a need for 50 additional housing units and some additions to the school staff.

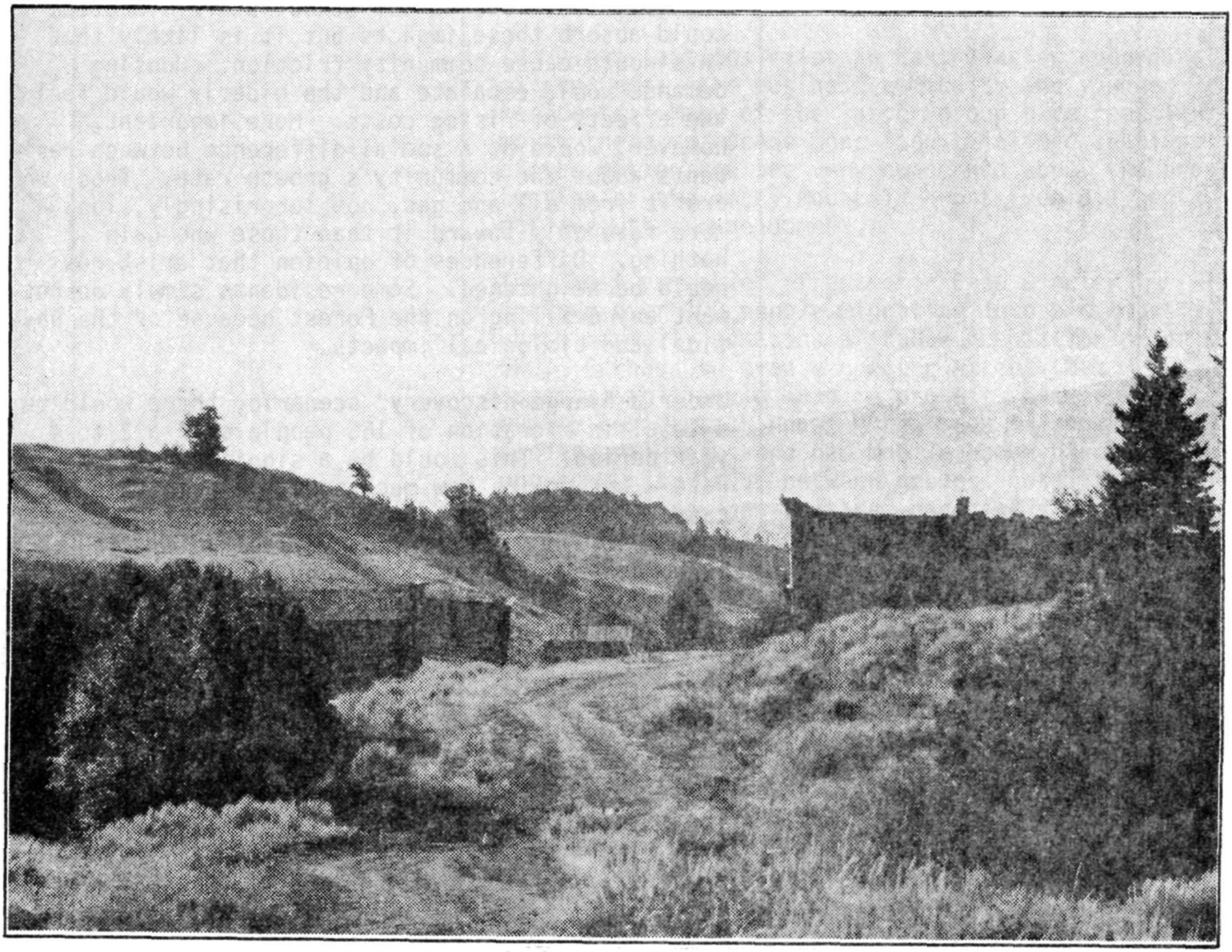
Augusta could handle the additional people, but such an increase would produce some negative effects on residents' lifestyles and would strain Augusta's ability to provide adequate service such as water, sewage, telephones, and electrical power. One of the most immediate problems which would be encountered is a lack of housing. Existing house values would increase, as would rental prices. New houses may be built within the area, but more likely there would be an influx of mobile homes and uncontrolled real estate development.

The economy would benefit during development stages; payrolls would total about $1 million from those directly working on oil and gas operations. These activities would also generate about $600,000 from derivative or new secondary employment. Benefits would accrue mostly to local businesses and landowners, but would also effect everyone within the area.

The everyday pattern of life in Augusta would change. The most immediate effect would simply be the increase in traffic rolling through town and the sheer increases in the number of people. With more people, local businesses would do well and new businesses would start up to handle the additional volume. Employment opportunities may grow for residents, especially women and new part-time workers, although this may be offset by the in-migration of workers seeking new employment. One negative aspect may be that local workers from all sectors may quit their jobs to take higher paying oil and gas employment, thus leaving a vacuum of experienced workers. If there are any shortages of goods or services, prices may tend to climb, especially with the increased amount of income circulating through the community. This would hurt everyone whose income has not risen accordingly.

With a "large discovery" in the area, the effects would be accentuated, with a total in-migration of about 165 people during the development stage. It is difficult to estimate the social impact difference between the "most probable" scenario and a "large discovery" - whether there is a threshold of sensitivity between the two levels of activity.

With a large discovery, there would be a greater change of certain negative impacts (e.g. a loss of the quiet and predictable pace that Augusta is known for or a loss of familiarity and trusting between neighbors). Community belonging, pride, and care would also be impacted and changes in lifestyles and heightened levels of stress would show up in increased social problems. Economic benefits to the community are a doubling of the payroll and jobs.



CASTLETOWN; AN ABANDONED MINING TOWN
IN THE CASTLE MOUNTAINS.

SOCIAL AND ECONOMIC - CHOTEAU

Choteau is a community with a high proportion of elderly residents and a slow-paced lifestyle. Oil and gas activities now impact these aspects of community life and will continue to do so in the future. Oil and gas royalties and employment/income have been an economic benefit to the community and county tax base. The agricultural and tourism sectors have been down in recent years and oil and gas has taken up the slack.

Under the "most probable" scenario over a 2 to 4 year period, there would be a total in-migration of 110 people, a need for 50 additional housing units, and some additions to the school staff. Choteau could absorb these impacts but it is likely that this would cause community friction. Housing demands would escalate and the elderly would feel the effects of rising costs. More important, however, would be a social difference between residents about the community's growth rate. Those who profit from oil and gas, not surprisingly, look more favorably toward it than those who gain nothing. Differences of opinion that exist now would be heightened. Some residents simply do not want any drilling on the Forest because of the physical and biological impacts.

Under a "large discovery" scenario, there would be a total in-migration of 165 people over a 2 to 4 year period. This would be a significant growth rate - but again, how much social strain this would cause is a function of residents' attitudes toward growth. To some, any negative social impacts would be compensated by positive economic impacts. To others, any positive economic gains would be cancelled by a significant disruption of lifestyle.

SOCIAL AND ECONOMIC - BROWNING AND EAST GLACIER

The "most probable" scenario for oil and gas activities and a "large discovery" scenario for the northern Two-Medicine area would show similar change. At the present time, a high level of seismic activity is taking place in these areas and this has had the effect of overcrowding. The economic benefits of oil and gas have helped the communities, especially during the non-tourist season. Some business operations, such as outfitters and guides, could be adversely affected by the disruption of the semi-primitive recreational setting by oil and gas activity. Traditionally used campsites would be protected by no-occupancy stipulations.

Two clear factions exist in East Glacier regarding oil and gas: the business community and younger residents. Many of the latter group have recently moved there to escape more industrialized sections of the nation and are very concerned about the protection of the Rocky Mountain Front from oil and gas and other development.

The "most probable" effects for East Glacier include over 100 people migrating into a community which normally contains a stable population of only 500. Perhaps to even a greater extent than Augusta, this would lead to protests between community residents. Housing has been in short supply for several years and new mobile homes have been one community issue between groups. Utility hookups for any new housing, especially sewage and telephone, would also be a problem.

Competition for goods and services has been keen. Existing oil and gas activities and community friction can be felt. In the most probable scenario, it is possible that many of the younger residents would move out of the community.

The impacts on East Glacier from a "large discovery" would be more accentuated than those of the "most probable" scenario. Community frictions, demands for goods and services, and loss of life-quality would have a corresponding increase with a total in-migration of 165 people during the development phase.

The Blackfeet Indian population would also be affected by oil and gas activity in this area.

Economic benefits would accrue to the service sector of Browning and East Glacier. Increased employment would result. Community cohesion could be upset over the population growth and the oil and gas activity.

The Two-Medicine area lies within the Indian Treaty lands. Increased access into the area would provide greater opportunity to the Blackfeet for hunting, fishing, and wood gathering. However, some Blackfeet may not like to see the area changed from its natural state.

MINERALS - METALLICS

Exploration and development of metallic or hard rock minerals on National Forest System lands are carried out by private companies. The activities associated with mineral prospecting and extraction are listed below.

PROCESS STEPS	ACTIVITIES
Prospecting	Digging holes, drilling holes, or using explosives Roading
Extraction	Drilling, digging, and using explosives to make mine shaft or open pits Disposal of mine tailings Facilities Roading
Reclamation	Landscaping, seeding, planting, securing, or closing mine openings.

Metallic mineral exploration and development will occur under all alternatives. Alternatives A-1, B-1, and E-1 would be more restrictive on metallic mineral activities because of more acres designated for wilderness. Operating plans for mining would include provisions to minimize adverse impacts on surface resources and would include requirements for mitigation.

Recreation

Under all alternatives, developed recreation sites would be protected from adverse effects of metallic mineral activities through surface use regulations.

Wilderness and semi-primitive recreation setting could be affected by road or trail construction for access to valid claims and localized disturbance during exploration and development.

Visual Quality

Under all alternatives, mining operations within the proximity of arterial and collector roads could adversely affect visual quality. Any open slope or open pit mining would affect visual quality.

Wildlife and Fish

Small mammal and fish habitat could be eliminated in localized areas of placer and dredging operations. Fish habitat improvements and revegetation measures would help re-establish these habitats.

Soil and Water

The mineral potential is low for placer and dredging operations. A large operation would affect about two or three acres and would affect soil and water in the local area. Soil disturbance would require restoration measures and special measures would be needed to prevent increasing sedimentation in the local streams. Underground mining is expected to occur and would create mine tailing disposal sites of one to 13 acres in size. Mitigation of these disposal sites will include site location away from live water, landscaping, and revegetation measures. Access roads and trails would be constructed under the Forest Management Practices, Standards, and Guidelines.

Social and Economic

Alternatives A-1, A-2, and E-2 would enhance the lifestyle and job opportunity of those economically dependent on mining while Alternative C would limit this lifestyle and opportunity. Discovery of a sizeable quantity of marketable metallic or hardrock mineral would have similar impacts to local communities. These impacts are discussed under the social and economic effects of oil and gas.

SOIL AND WATER

Soil and Water Management Programs protect, conserve, and enhance the soil and water resources. Activities include monitoring water quality, quantity, and the effects of activities on soil, and protecting the resources where needed with structural improvements and other mitigating actions.

Soil and water management would have little or no significant effect on the physical and biological environment. Table 4.1 displays the acre feet of water and tons of sediment produced by alternative. Restoration of watersheds disturbed in the past would increase water quality in some areas, although the need for restoration is very small. Restoration of newly disturbed areas would be done upon completion of the project under all alternatives.

Social and Economic

Under all alternatives maintaining water quality for human consumptive use foregoes the opportunity for timber and grazing in two municipal watersheds. This loss would not be great because the potentials for timber harvesting and grazing are not high in these small areas.

LANDS

The Lands Program deals with special use management, land adjustment planning, land exchange and acquisition, and rights-of-way acquisition.

Land Adjustment

The effects of land adjustments would be the same under all alternatives. Favorable biological effects would be a possible increase in the carrying capacity of elk since some land adjustments include acquiring winter habitat. More opportunities for big game hunting would be created. If acquired lands contain substantial amounts of timber, the Forest would be able to manage these under sustained yield principles and increase the timber harvest level. Adverse impacts could be a decrease in the tax base for counties if the 25 percent fund and PILT (payment in-lieu of taxes) does not compensate for local tax levels and possibly unfavorable acceptance by the public of increasing government ownership of land. These two effects would probably not be significant because adjustments are made mainly through land exchanges.

Right-of-Way

Table 4.1 displays acres of land required for right-of-way under each alternative. The amount of right-of-way varies by the amount and location of timber harvested under each alternative. The Preferred Alternative (F) concentrates the timber harvest areas and requires less access across private lands.

Private citizens whose lands are involved in rights-of-way may be adversely impacted. These effects include possible range management problems such as the need for additional fencing. Also with the public in close proximity to private lands, littering and vandalism problems could result.

Favorable economic and social effects would be more public lands available for a variety of uses, such as timber harvesting, oil and gas development, recreation, and firewood gathering. Wildlife would be adversely affected, especially big game and T&E species. Additional access to the Forest could result in increased harvesting of big game, especially elk.

For further effects on wildlife, see the Facilities, Timber, and Minerals portions of this chapter.

FACILITIES - ROADS

The Facilities Program provides and maintains capital improvements such as road and trails. Transportation planning, road engineering and design, construction and maintenance of local, collector, and arterial roads and trails are all activities included in facilities management. Table 4.1 shows the acres disturbed from roading by alternative. Roading may have an adverse long term, irretrievable effect on the physical environment.

Recreation

Alternatives with the highest road construction levels would cause the greatest change in recreation settings. Road construction would affect recreationists in alternatives A-1, A-2, B-1, B-2, E-1, and E-2 by changing the recreation setting from a semi-primitive to a roaded natural appearing setting. This would be considered a long term effect, even though it could be mitigated through road closures and restoration of roadbeds. Roading in turn would affect the types of recreation activities and user groups. Roads and trails would increase the motorized recreation opportunity for automobiles, snowmobiling, and trail biking. Table 4.1 shows the acres maintained by the different recreation settings.

Visual Quality

Road construction under all alternatives would create visual impacts by removing vegetation and disturbing the soil, thus changing the color, texture, and lines of the landscape. In open areas, roads introduce stong lines into the landscape that can be visible for many miles depending on topography and vegetation. Cut and fill areas are often highly visible and may alter the landscape for long periods of time. These impacts would not be as great for Current Plan and Alternatives C, D, and F (Preferred) which harvest less timber. Trail construction would have little effect on the visual quality. Visual management objectives provide for mitigating measures to help reduce the effects of roading.

Wildlife

Road management under all alternatives is a critical element to wildlife, particularly for T&E and big game species. Elk and deer are the major species affected. Actual road construction removes vegetation or wildlife forage, however, the critical effect is the increased access people have to the Forest. Human activity and encounters with wildlife can disturb elk calving areas, migration routes, forage areas, dens, and security cover. Potential effects include displacement of animals from their historically used ranges, poaching and less protection from hunters, and in the case of the grizzly bear and wolf, human to animal confrontations which lead to the killing or relocation of the animal. Trail management presents some of the same effects, but again to a much lesser degree. Alternatives A-1 and A-2 have the most roads. Some alternatives such as F (Preferred) recommend the closure of new roads in critical wildlife habitat to mitigate adverse impacts. Alternatives C and D provide for the least disturbance from roads.

Road construction through riparian areas adversely affects stream channels and fisheries. Road construction in riparian zones would be avoided under all alternatives and any stream crossing will be designed to avoid blockage of fish movement.

Soil and Water

Road construction causes the disturbance and removal of the soil which can result in soil erosion, increased sedimentation in streams, and diminished water quality. This effect varies by the amount of road constructed and the by the type of soils roads are constructed on. Trail construction has similar affects but to a much lesser degree. Proper road location, design, construction, and installation of drainage structures would help mitigate the on-site and off-site impacts of road construction. Alternatives A-1, A-2, E-1, and E-2 show more acres disturbed by roading than the other alternatives.

Protection

Because roading provides greater access to the Forest, more timber stands which are susceptible to insects and disease may be harvested. Alternatives A-1, A-2, B-1, B-2, E-1, and E-2 provide the greatest opportunity to harvest stands whereas Alternatives C and D have the least. Except where road closures occur, an increase in roads would raise the risk of person-caused fires.

Social and Economic

Roading can have indirect economic benefits to timber, ranching, and mining operations because it provides access to timber, rangeland, and minerals. Ease of access reduces the cost to the operation as well as increasing the supply of the commodity.

Roading can reduce the security habitat for elk, which reduces hunting opportunity. Roading can also have an adverse effect upon the symbolic meaning people may attach to the roadless natural setting of a particular area. For instance, some Blackfeet Indians may not want to see the Indian Treaty lands changed by road access, timber harvesting, or oil and gas development. On the other hand, roading can provide greater opportunities for people to enjoy the area or derive economic benefit. Road management such as road closure and careful placement of roads can provide mitigation of the adverse effects.

PROTECTION - WILDLIFE

The Fire Management Program includes the prevention and suppression of wildfires, the use of fire to dispose of activity-created fuels, and use of prescribed fire to improve resource values.

The effects of wildfire would be basically the same under all alternatives and are discussed only briefly because they are the same. Prescribed fire and fuel disposal are discussed under the resource element that where occur.

Impacts of wildfire would vary with the intensity of the fire. Intense fires may adversely affect water and air quality, productivity of the soil, and may have an economic impact through loss of commercial timber and grazing. Less intense wildfires have favorable impacts, such as higher levels of nutrient recycling and acceleration of forage growth for big game following a fire. The Level III fire analysis which will be included in the Final Forest Plan will address when and where fire may be used by letting certain areas burn within prescription.

PROTECTION - INSECT AND DISEASE

The effects of insects and disease are discussed throughout this chapter. An index of relative effects is shown in Table 4.1.

SOCIAL/ECONOMIC CONSEQUENCES

Area of Influence

The social and economic characteristics of the people surrounding the Lewis and Clark Forest are unique compared to many of the other National Forests. The economic structure is highly dependent upon natural resources such as farming, ranching, logging and lumber processing, and some mining. This dependency is especially true for the rural communities next to the Forest and to a lesser extent for Great Falls (although it too services the agricultural sector for central Montana). These natural resource sectors provide primary jobs; most of the remaining jobs (retail, services, and construction) are directly dependent upon them. Compared to the rest of the nation and to Montana, little manufacturing is in the Forest's area of influence.

Much of the future growth remains tied to the natural resources. The area has made repeated attempts to lure new business in, but with only limited success. Although it offers many opportunities, its weather and geographic isolation will continue to make businesses look elsewhere. Tightening credit, escalating energy and fertilizer prices, and high transportation costs continue to make the economic situation bleak. Any alternatives which have negative economic impacts would be especially bad because of these economic conditions; likewise, any positive impacts would have beneficial effects.

Table 4.1 shows changes in population, employment, and income by alternative. Also shown are the changes in social variables which are discussed throughout this chapter.

Population

Little negative population impact is in any of the alternatives because of the low existing population densities and the small rate of projected population growth. In Alternatives A-1, A-2, B-1, B-2, E-1, E-2, and F, which result in increased populations, not newcomers' lifestyle values would differ radically from those values that presently exist. Alternatives A-1 and A-2 would have population increases which may effect small communities such as White Sulphur Springs which would process the increased wood products from these alternatives.

Increased population in the White Sulphur Springs area would most likely increase pressures for land subdivisions in Alternatives A-1, A-2, E-1, and E-2. Most rural communities within the area-of-influence want community growth and, therefore the costs of new ownership patterns would be more acceptable.

Increased population within the Monarch-Neihart area may also cause disruptions of ownership patterns in the same alternatives. An increased density of homes on private lands in the Little Belts would conflict with many residents sense of appropriate private land use.

Employment

Alternatives A-1, A-2, E-1, and E-2 provide the greatest increase in job opportunity over the Current Plan. This increase would take place in the wood products industry. Alternatives B-1, B-2, and F (Preferred) provide moderate increases in job opportunity also in the wood processing industry.

Alternatives C and D would not significantly affect job opportunity. Timber operations within the area are dependent upon demands. Continued high interest rates, more multi-family dwellings, wood substitutes, and lower operation costs in other regions all point to rough times for local timber concerns. Logging and processing will most likely continue in the area but will involve temporary layoffs.

Job opportunities in the ranching sector are limited because farms and ranches can support only a given number of people. Maturing youth will continue to look outside of the area for jobs. This has led to an older population structure in the past and will continue to do so in the future. These age differences will continue to have effects on recreation preferences.

Income

Like population and job opportunity, income effects are largely related to the output of the timber resource. All alternatives, except C, would increase the income to the area; however, only Alternatives A-1, A-2, E-1, and E-2 would be significant. These alternatives would provide a beneficial effect to local area income.

United States
Department of
Agriculture

**Lewis and Clark
National Forest Plan**
P.O. Box 871
Great Falls, Mt. 59403

... A Report

Middle Fork Judith and Big Snowies Montana Wilderness Study Act Areas

Photo: Top of Canyons in the Middle Fork Judith Wilderness Study Area.

DEIS
SECTION 2
MONTANA WILDERNESS STUDY ACT AREAS

INTRODUCTION

This section of the Draft Environmental Impact Statement deals with the Middle Fork Judith and Big Snowies MWSA (Montana Wilderness Study Act Areas).

Chapter I, Purpose and Need, describes the legislative framework, planning process, general description, and issues of the two wilderness study areas.

Chapter II, Alternatives Considered, describes the alternatives for the MWSA areas analyzed in the planning process.

Chapter III, Affected Environment, describes the various environments of the MWSA areas.

Chapter IV, Environmental Consequences, forms the scientific and analytical basis for the comparison of the alternatives.

This section combines with Chapter V, List of Preparers; Chapter VI, List of Persons, Agencies, and Organizations To Whom Copies of Statements are Sent; Chapter VII, Index; and the Appendices to form a separate but tiered document.

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SUMMARY

Overview

The first part of this Summary describes the MWSA (Montana Wilderness Study Act), and the planning process. The second part describes alternative formulation, opportunity for change, and alternatives that were eliminated from detail study. Next the alternatives that were considered in detail for the Middle Fork Judith are described. Table MS2.1 shows the allocation of land by management emphasis and Table MS2.2 the resource production and effects by alternative for the Middle Fork Judith. Last the comparison, evaluation, and effect are summarized.

These items are repeated for the Big Snowies. Table MS2.3 shows the allocation of land by management emphasis and Table MS2.4 the resource production and effects by alternative.

A more detailed description of these actions can be found in the DEIS (Draft Environmental Impact Statement) for the Lewis and Clark Forest Plan.

Detailed information of the management of the Lewis and Clark National Forest under the Preferred Alternative can be found in the Lewis and Clark Proposed Forest Plan.

These documents are available for review at all Lewis and Clark offices located at Augusta, Choteau, Stanford, Harlowton, White Sulphur Springs, Belt Creek, and Great Falls. Request for copies of the DEIS or Proposed Forest Plan should be sent to:

Lewis and Clark National Forest
P.O. Box 871
Great Falls, MT 59403

Montana Wilderness Study Act

On November 1, 1977, Congress passed the Montana Wilderness Study Act (Public Law 95-150). The Act requires the Secretary of Agriculture to study and make recommendations to Congress by 1982 on the wilderness suitability of nine separate National Forest areas in Montana containing 973,000 acres.

In the MWSA (Montana Wilderness Study Act), Congress specified that the nine areas be studied using the procedures in Section 3(b) and 3(d) of the Wilderness Act (Public Law 88-577).

In June of 1977, the Forest Service launched the RARE II (Roadless Area Review and Evaluation) Study. The purpose of RARE II was to identify all roadless and undeveloped areas in the National Forest System and recommend their allocations as either wilderness or nonwilderness. All of the nine MWSA areas were included in the RARE II inventory completed on October 1, 1977.

The RARE II process did not include public notice and hearings and their incorporation in the report to Congress. The Forest Service decided to include the MWSA areas in the RARE II process to the extent possible. Through the RARE II process, all MWSA areas were placed under the further planning recommendation until the remaining legislative requirements were completed.

In November, 1979 the Regional Forester decided to conduct a Regional study of three of the MWSA areas, with the remaining six to be analyzed in the respective Forest Plans. The two areas in the Lewis and Clark, the Middle Fork Judith and the Big Snowies, were analyzed in the Lewis and Clark Forest Plan process.

The purpose of this environmental impact statement is to display the environmental consequences that would result from implementing the proposed action for the Middle Fork Judith and the Big Snowies. The environmental consequences will be addressed in terms of the issues identified during the MWSA Public Workshops in September, 1979, as well as the other public issues associated with MWSA areas.

Planning Process

The planning process uses an interdisciplinary approach in developing the alternatives. This interdisciplinary approach was used throughout the planning process in analyzing the affected area, estimating the environmental effects, and writing the DEIS (Draft Environmental Impact Statement). The interdisciplinary team used during this process included specialists from the natural and social sciences and environmental design arts. Frequent interaction between team members ensured consideration of all resources and interests in the analysis and decisions documented in the DEIS. A complete listing of the make-up of the interdisciplinary team is contained in the planning record, "Lewis and Clark National Forest Work Plan," and in the List of Preparers, "Forest Plan Draft Environmental Impact Statement," Chapter V.

The planning process, outlined in implementing regulations of the National Forest Management Act, was followed to develop the proposed action. The planning actions, as specified in the regulations and used in the Forest Planning process, are:

1. Identification of issues, concerns, and opportunities
2. Development of planning criteria
3. Inventory of data and information collection
4. Analysis of the management situation
5. Formulation of alternatives
6. Estimated effects of alternatives
7. Evaluation of alternatives
8. Selection of the preferred alternative
9. Implementation
10. Monitoring and evaluation

Remaining Process

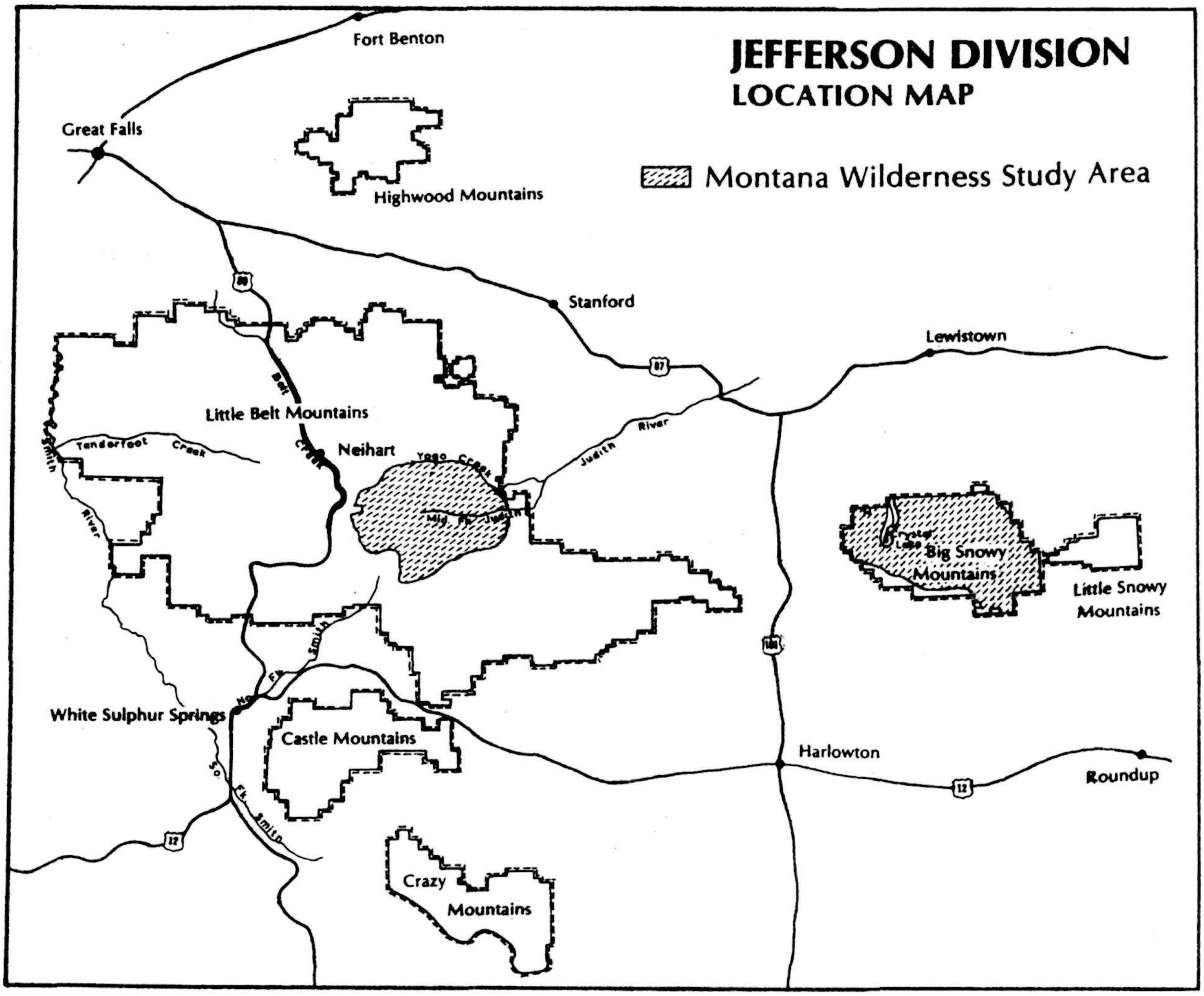
This DEIS has been prepared and circulated for comment after completion of planning actions 1 through 7. As part of planning action 7, a preferred alternative is shown in the DEIS and is the basis for managing the Middle Fork Judith and Big Snowies in the Proposed Lewis and Clark National Forest Plan. After the close of the comment period, planning actions 1 through 7 will be repeated to the extent necessary and a FEIS (Final Environmental Impact Statement) will be prepared, filed with the Environmental Protection Agency, and made available to the public.

Preliminary Recommendations

Any recommendations for the MWSA area in this statement and the Forest Plan are preliminary administrative recommendations. They will receive further review and possible modification in the offices of the Chief, the Secretary of Agriculture, and the President. Congress has reserved the right to make final decisions on wilderness designation.

Wilderness Study Management

Until Congress determines otherwise, the wilderness study areas will be managed, subject to existing private rights and uses, to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System until Congress determines otherwise.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LOCATION MAP
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Great Falls
Highwood Mountains
Stanford
Lewistown
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87
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12
Little Belt Mountains
Belt Creek
Neihart
Yogo Creek
Judith River
Mid. Fk. Judith
Tenderfoot Creek
Smith River
Crystal Lake
Big Snowy Mountains
Little Snowy Mountains
Smith
No. Fk.
White Sulphur Springs
Castle Mountains
So. Fk. Smith
Harlowton
Roundup
Crazy Mountains

ALTERNATIVE FORMULATION

ALTERNATIVE FORMULATION

Alternative formulation for MWSA was similar to that of the Forest Plan. Alternative formulation, planning action 5, results from a systematic set of interrelated actions beginning at the start of the planning process. In particular, these are planning actions 1 through 4, listed in Chapter I. The following discussion presents these actions in more detail.

Planning Action 1 - Identification of Issues, Concerns and Opportunities

Public issues and opportunities for management were identified through public involvement efforts, coordination with other Federal agencies, State agencies, and local governments. Other resource issues and management concerns are specified in laws and regulations which provide direction for National Forest Policy. Several issues were specified in the MWSA itself. These issues and concerns are listed in Chapter I. Details on the process used to develop issues, concerns, and opportunities are available in the planning record, "MWSA Workshop Analysis Summary".

Planning Action 2 - Development of Planning Criteria

Criteria were established to guide the planning process and management direction. Process criteria for the collection of inventory data, analysis of the management situation, and the formulation of alternatives were developed by the interdisciplinary team. Process criteria are documented in the planning record, "Proposed Criteria and Documentation".

Planning Action 3 - Inventory of Data and Information Collection

Using resource inventories, a comprehensive data base was formed, including landform, soils, wildlife, and vegetation information. A timber stand analysis specific to the MWSA areas was completed and used in the formulation of timber yield tables. Details on contents of the data base are contained in the planning record, "Data Base Components".

ALTERNATIVE FORMULATION AND OPPORTUNITY FOR CHANGE

Planning Action 4 - Analysis of the Management Situation

The analysis of the management situation for the Forest included identification of feasible ranges of goods, services, and uses; projected use levels; potential to resolve issues and concerns; the feasibility of providing the levels of goods, services, and uses resulting from assigned RPA objectives. This analysis identified the opportunity to change management direction. The Middle Fork Judith and Big Snowies MWSA areas were included in the analysis.

Planning Action 5 — Formulation of Alternatives

Alternatives listed different ways to address and respond to the major public issues, management concerns, and resource opportunities identified during the Forest planning process. Alternatives result from planning actions 1 through 4 and are documented in Section 2 of the planning record, "Alternatives".

OPPORTUNITY FOR CHANGE

The MWSA directs that the Middle Fork Judith and Big Snowies be studied for possible inclusion into the National Wilderness Preservation System. As part of this study, the Analysis of the Management Situation for the Forest identified opportunities to change management direction for individual resources. Additional analysis was done for the Middle Fork Judith and Big Snowies Wilderness Study Areas. Currently the areas are managed to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System until Congress determines otherwise. The following areas were examined for the opportunity to change from current direction.

Dispersed Recreation

Recreation opportunity is the projected capacity of an area to provide dispersed recreation based on the area's recreation setting. Current available dispersed recreation opportunity is 28,000 RVDs (Recreation Visitor Days) in the Middle Fork Judith and 20,600 RVDs in the Big Snowies. Current use in the Middle Fork Judith is 20,800 RVDs and in the Big Snowies 5,700 RVDs.

The maximum dispersed recreation opportunity available is 333,100 RVDs in the Middle Fork and 163,100 RVDs in the Big Snowies. It is attained by accessing these undeveloped lands. This causes a change in the recreation setting from semi-primitive to roaded natural appearing. This setting provides more dispersed recreation opportunity.

OPPORTUNITY FOR CHANGE

The least dispersed recreation opportunity available is 23,000 RVDs in the Middle Fork and 11,500 RVDs in the Big Snowies. This would occur under wilderness classification. Wilderness, by its nature, requires solitude and tranquility.

Wilderness

The maximum area in the two study areas which could be classified as wilderness is 189,885 acres, a total of the two study areas.

Wildlife

The current elk population is 1,200 animals in the Middle Fork Judith and 100 animals in the Big Snowies. The maximum elk population for these areas cannot be determined. Both areas contain little big gam winter habitat. Winter habitat is the limiting factor for elk population in these areas.

Range

The current domestic grazing level in the Middle Fork is 900 AUMs (Animal Unit Months) and in the Big Snowies, 2,700 AUMs. Under maximum production, the Middle Fork could provide 1,500 AUMs and the Big Snowies, 3,700 AUMs.

Timber

The Middle Fork Judith has a standing volume of 460 million board feet. If all the available and capable lands were regulated for timber harvest, where rotation age is culmination of mean annual increment, 3.84 million board feet could be harvested each year.

The Big Snowies has a standing volume of 317 million board feet. If all the available and capable lands were regulated for timber harvest, where rotation age is culmination of mean annual increment, 3.41 million board feet could be harvested each year.

Minerals

The Middle Fork Judith has a high potential for hard rock minerals and low or no potential for oil and gas.

The Big Snowies has a low potential for hard rock mineral, and oil and gas.

ALTERNATIVES DEVELOPED

The alternatives to be considered in detail and those eliminated from detailed study were identified after completing the analysis of the management situation. Effort was concentrated in developing a reasonable range of alternatives that could be analyzed within the limits set by the capability of the Forest and that were responsive to public issues and management concerns.

ALTERNATIVES ELIMINATED FROM DETAILED STUDY

The Forest developed and examined several alternatives which were eliminated from detailed analysis. These alternatives included:

Part Wilderness / Part Other Management

An alternative which would recommend the Middle Fork of the Judith as wilderness and manage the Lost Fork for commodities was examined. This alternative was not considered for detail analysis because it substantially reduced the wilderness quality of the Middle Fork Judith with only a slight increase in commodity products.

An alternative which would manage the upper Middle Fork of the Judith for commodity products and recommend the rest of the study area for wilderness classification was examined. This alternative was eliminated from detail analysis because most of the effects, except for wilderness classification, are similar to Alternative 6.

Boundary Changes

The boundary of each alternative was carefully examined to see if there was opportunity to make changes to reduce resource conflicts and increase user opportunities.

The Middle Fork Judith contains 64 miles of primitive or low standard roads; these roads are found throughout the study area. There are several areas of known mineral interest. There are 1,154 acres of private land in the middle of the study area. Three areas have been identified where human activities are readily apparent. There appeared to be little opportunity to reduce resource conflict or increase user opportunity by modifying the boundary.

The Big Snowies contains 50 miles of low standard roads. These roads penetrate almost all major drainages. The opportunities for boundary changes are small and would not significantly affect resource outputs or uses.

Special Management Designations

The use of special management area designation under 36 CFR 294 was considered. This designation is used to recognize unique areas with outstanding attributes which should have some type of National designation. Neither the Middle Fork Judith nor Big Snowies are perceived to have these attributes.

NFMA regulations through the Forest planning process provide the Regional Forester with the authority to establish management direction for all areas. This authority would be equal to a special management designation.

ALTERNATIVES CONSIDERED IN DETAIL

This part of the summary considers the alternatives studied in detail. The first part deals with the Middle Fork Judith and the second part with the Big Snowies.

The following alternatives were considered in detail for the Middle Fork Judith Wilderness Study Area:

Alternative 1 - Forest Plan Alternatives Current Plan & C (No Action Alternative)	The Middle Fork Judith Wilderness Study Area would be managed for semi-primitive recreation and wildlife habitat, especially elk habitat, through improvement practices.
Alternative 2 - Forest Plan Alternatives A-1, B-1, & E-1	The Middle Fork Judith Wilderness Study Area would be recommended for wilderness classification.
Alternative 3 - Forest Plan Alternative A-2, & E-2	The Middle Fork Judith Wilderness Study Area would be managed to provide a high level of commodity products to meet the RPA Recommended Program.
Alternative 4 - Forest Plan Alternative B-2	The Middle Fork Judith Wilderness Study Area would be managed to provide a moderate level of commodity products.
Alternative 5 - Forest Plan Alternative D	The Middle Fork Judith Wilderness Study Area would be managed for a low level of commodity products.
Alternative 6 - Preferred Alternative - Forest Plan Alternative F	The Upper Middle Fork Judith would be managed for commodity products; the remaining part of the area would be managed for semi-primitive recreation and wildlife habitat.

The allocation of land management emphasis by alternative is shown in Table MS2.1. A summary of resource production and effects for the alternatives is shown in Table MS2.2.

TABLE MS2.1
ALLOCATION OF ACRES TO MANAGEMENT EMPHASIS BY ALTERNATIVE

MIDDLE FORK JUDITH

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	(Preferred) Alt. 6
Mininum Level Management	88140	0	33257	33570	83530	75696
Range Management	2436	0	4980	6770	2525	981
Timber Management	0	0	40681	42876	910	10412
Timber/Range Management	0	0	222	0	149	2064
Timber/Wildlife/ Visual Management	0	0	11576	7363	4885	836
Wildlife Management	1424	0	1284	1421	0	2011
Wilderness Management	0	92000	0	0	0	0

1/ A description of the FORPLAN prescriptions grouped into these management emphases is given in Appendix C.

TABLE M2.1
MIDDLE FORK JUDITH

SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE
Average Annual Output

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6 (Preferred)
Minerals							
- Lands available for Oil and Gas Occupancy Leasing	Thousand Acres	1.3	0	1.3	1.3	1.3	1.3
Roads							
- Arterial and Collector to be constructed	Miles						
- 1982-1990		0	0	.9	.6	.6	0
- 1991-2000		0	0	0	.6	0	.6
- 2001-2010		0	0	.2	.2	.3	.3
- 2011-2020		0	0	.6	0	0	.2
- 2021-2030		0	0	0	0	.2	0
Local	Miles						
- 1982-1990		0	0	13	4	4	0
- 1991-2000		0	0	0	7	0	1
- 2001-2010		0	0	9	14	3	1
- 2011-2020		0	0	8	1	0	1
- 2021-2030		0	0	3	5	1	1
Prescribed burning	Acres	10	0	60	30	40	50
Social/Economic							
- Change in Employment							
1982-1990	Person Years	0	0	140	50	45	0
2021-2030		0	0	35	60	5	5
Returns to U.S. Government 1/	Thousand Dollars						
- 1982-1990		6.6	1.6	218.6	84.6	76.6	6.6
- 2021-2030		6.6	1.6	60.8	96.8	12.7	16.7
Total Budget required to implement 1/	Thousand Dollars						
- 1982-1990		72.3	62.4	286.4	166.0	1416.4	72.4
- 2021-2030		72.3	62.4	124.1	158.4	242.7	319.5
Present Net Value @ 4% 1/	Thousand Dollars	4858.8	5406.4	43302.8	37778.9	10550.7	7099.8

1/ Values given in 1978 dollars

TABLE M2.1
MIDDLE FORK JUDITH

SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE

Average Annual Output

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6 (Preferred)
Recreation Use Potential by 2030 (Base Year in Parentheses)	Thousand RVDs						
- Primitive (0)		0	23.0	0	0	0	0
- Semi-Primitive (28.0)		28.0	0	0	2.7	15.7	21.1
- Roaded Natural Appearing (0)		0	0	333.1	303.3	138.5	87.2
Recreation Setting by 2030 (Base Year in Parentheses)	Thousand Acres						
- Wilderness (0)		0	92.0	0	0	0	0
- Semi-Primitive (92.0)		92.0	0	0	8.3	53.8	67.8
- Roaded Natural Appearing (0)		0	0	92.0	83.7	38.2	24.2
Visual Quality Objectives	Acres						
Preservation		0	92.0	0	0	0	0
- Partial Retention		92.0	0	0	8.3	53.8	67.8
- Modification		0	0	92.0	83.7	38.2	24.2
Wildlife							
- Habitat Improvement	Acre Equivalents						
-1982-1990		30	0	70	30	30	70
-2021-2030		30	0	100	30	30	70
- Elk Population Potential	Number						
-1982-1990		1200	1200	1200	1200	1200	1200
-2021-2030		1200	1200	1120	1120	1180	1180
- Elk Hunter Recreation	Hunter Days						
-1982-1990		8000	8000	7100	7700	7800	8000
-2021-2030		8000	8000	4500	4300	7200	7300
Range	AUMs						
- 1982-1990		900	900	900	900	900	900
- 2021-2030		900	900	980	940	980	940
Timber							
- Land Available, Capable, and Suitable	Acres	0	0	52.5	50.2	5.9	13.3
- Programmed Sales Offered	Million Board Feet						
- 1982-1990		0	0	10.6	3.9	3.5	0
- 1991-2000		0	0	0	6.0	0	1.1
- 2001-2010		0	0	7.8	12.1	2.3	1.1
- 2011-2020		0	0	7.2	.5	0	.5
- 2021-2030		0	0	2.7	4.5	.3	.5
- Reforestation (Natural and Planting)	Acres						
- 1982-1990		0	0	1270	440	400	0
- 1991-2000		0	0	0	670	0	120
- 2001-2010		0	0	870	1350	260	120
- 2011-2020		0	0	800	60	0	60
- 2021-2030		0	0	300	500	40	60

ALTERNATIVE SUMMARY

This part of the chapter summarizes the comparison and evaluation of alternatives.

Alternative 1

Alternative 1 would maintain the Middle Fork of Judith Wilderness Study Area much like it is today. The area would remain undeveloped and timber would not be harvested on a regulated basis. Both motorized and non-motorized semi-primitive recreation opportunities would be provided. Game and non-game habitat would not change. Elk and hunting opportunities would not change. Direct effects would be a loss of primitive recreation (wilderness) and timber management opportunities.

Alternative 2

Alternative 2 would recommend wilderness classification for the Middle Fork Judith Wilderness Study Area. Wilderness designation would result in the area being managed in such a manner as to leave it unimpaired for future generations use and enjoyment. Timber and motorized recreation opportunities would be foregone.

Alternative 3

Alternative 3 would provide the highest levels of timber and range outputs. All of the study area would be developed. Although elk numbers would decrease slightly, hunting recreation would be substantially reduced because of an increase in openings and more road access. Wildlife habitat improvement would change and most wildlife habitat improvement would be directed at mitigating the effects of other programs. Direct effects would be a loss of the most acres of semi-primitive recreation opportunity and elk security habitat.

Alternative 4

Like Alternative 3, Alternative 4 would also provide high levels of timber and range outputs. About 90 percent of the study area would be developed. Elk numbers would decrease slightly and hunting recreation would be substantially reduced. Most wildlife habitat improvement would be directed at mitigating other programs. Direct effects would be the loss of semi-primitive recreation opportunity and elk security habitat.

Alternative 5

Alternative 5 would provide moderate levels of timber and range outputs. About 40 percent of the study area would be developed. Hunting recreation would decrease although there would be only a small change in elk numbers. The lower canyon area would provide semi-primitive recreation opportunities. Direct effects would be a loss of semi-primitive recreation opportunity and elk security habitat on 38,240 acres.

Alternative 6 - Preferred

Alternative 6 would provide a low level of timber and a moderate level of range outputs. About 25 percent of the area would be developed. Both roaded natural appearing and semi-primitive recreation opportunities would be provided. Elk populations and hunting opportunity would decrease slightly.

Alternative 6 would forego the opportunity for wilderness classification on 24,160 acres by developing the area for commodities and retaining all multiple use options on 67,840 acres.

A PACK TRIP INTO THE MWSA AREA.

ALTERNATIVES CONSIDERED IN DETAIL

The following alternatives for the Big Snowies Wilderness Study Area were considered in detail:

Alternative 1 - Preferred Alternative, Forest Plan Alternatives C, D, & F

The Big Snowies Wilderness Study Area would be managed for semi-primitive recreation and wildlife habitat.

Alternative 2 - Forest Plan Alternatives A-1, B-1, & E-1.

The Big Snowies Wilderness Study Area would be recommended for wilderness classification.

Alternative 3 - Forest Plan Alternative A-2

The Big Snowies Wilderness Study Area would be managed to provide a high level of commodity products.

Alternative 4 - Forest Plan Alternative E-2

The Big Snowies Wilderness Study Area would be managed to provide a moderate level of commodity products.

Alternative 5 - Forest Plan Alternative B-2

The Big Snowies Wilderness Study Area would be managed to provide a low level of commodity products.

The allocation of land management emphasis by alternative is shown in Table MS2.3. A summary of resource outputs for the alternatives is shown in Table MS2.4.

TABLE MS2.3
ALLOCATION OF ACRES TO MANAGEMENT EMPHASIS BY ALTERNATIVE BIG SNOWIES

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Mininum Level Management	85289	0	27369	30715	47540
Range Management	9603	0	13220	16131	22182
Timber Management	0	0	28119	44375	23161
Timber/Range Management	0	0	3947	3115	777
Timber/Wildlife/ Visual Management	0	0	14880	648	1499
Wildlife Management	2812	0	5223	2901	2726
Wildlife/Range Management	181	0	5126	0	0
Wilderness Management	0	97885	0	0	0

1/ A description of the FORPLAN prescriptions grouped into these management emphases is given in Appendix C.

TABLE M2.3
BIG SNOWIES

SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE
Average Annual Output

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT-1 (Preferred)	ALT-2	ALT-3	ALT-4	ALT-5
Minerals						
- Lands available for Oil and Gas Occupancy Leasing	Thousand Acres	9.0	0	9.0	9.0	9.0
Roads						
- Arterial and Collector to be constructed	Miles					
- 1982-1990		0	0	.8	.8	.8
- 1991-2000		0	0	0	0	1.5
- 2001-2010		0	0	.5	.5	.5
- 2011-2020		0	0	3.1	3.9	1.0
- 2021-2030		0	0	4.6	3.9	3.1
- Local	Miles					
- 1982-1990		0	0	1	1	1
- 1991-2000		0	0	0	0	2
- 2001-2010		0	0	1	1	1
- 2011-2020		0	0	5	3	2
- 2021-2030		0	0	7	3	4
Prescribed burning	Acres	90	0	220	130	100
Social/Economic						
-Change in Employment	Person Years					
-1982-1990		0	0	5	5	5
-2021-2030		0	0	70	25	45
Returns to U.S. Government 1	Thousand Dollars					
- 1982-1990		52.4	4.9	60.4	60.4	60.4
- 2021-2030		52.4	4.9	159.5	71.5	120.7
Total Budget required to implement 1/	Thousand Dollars					
- 1982-1990		111.0	83.6	165.4	165.6	165.6
- 2021-2030		123.3	82.0	315.8	240.0	277.7
Present Net Value @ 4%	Thousand Dollars	-677.4	427.7	558.1	151.2	341.0

1 Values given in 1978 dollars

TABLE M2.3
BIG SNOWIES

SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE
Average Annual Output

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT-1 (Preferred)	ALT-2	ALT-3	ALT-4	ALT-5
Recreation Use Potential by 2030 (Base Year 1980 in Parentheses)	Thousand RVDs					
- Primitive (0)		0	11.5	0	0	0
- Semi-Primitive (20.6)		20.6	0	0	3.4	8.2
- Roaded Natural Appearing (0)		0	0	163.1	136.3	97.9
Recreation Setting by 2030 (Base Year 1980 in Parentheses)	Thousand Acres					
- Wilderness (0)		0	97.9	0	0	0
- Semi-Primitive (97.9)		97.9	0	0	16.0	39.1
- Roaded Natural Appearing (0)		0	0	97.9	81.9	58.8
Visual Quality Objectives	Thousand Acres					
- Preservation		0	97.9	0	0	0
- Partial Retention		97.9	0	0	16.0	39.1
- Modification		0	0	97.9	81.9	58.8
Wildlife						
- Habitat Improvement	Acre Equivalents					
-1982-1990		110	0	290	100	100
-2021-2030		110	0	320	100	100
- Elk Population Potential	Number					
-1982-1990		100	100	100	100	100
-2021-2030		100	100	100	100	100
- Elk Hunter Recreation	Hunter Days					
-1982-1990		1000	1000	1000	1000	1000
-2021-2030		1000	1000	800	900	900
Range	AUMs					
- 1982-1990		3000	2700	3000	3000	3000
- 2021-2030		3300	2700	3600	3600	3300
Timber						
- Land Available, Capable, and Suitable	Thousand Acres	0	0	46.1	49.9	44.8
- Programmed Sales Offered	Million Board Feet					
- 1982-1990		0	0	.4	.4	.4
- 1991-2000		0	0	0	0	1.6
- 2001-2010		0	0	.2	.2	.2
- 2011-2020		0	0	3.9	2.1	1.1
- 2021-2030		0	0	5.3	1.9	3.4
- Reforestation (Natural and Planting)	Acres					
- 1982-1990		0	0	40	40	50
- 1991-2000		0	0	0	0	210
- 2001-2010		0	0	20	20	30
- 2011-2020		0	0	480	260	140
- 2021-2030		0	0	660	240	430

Alternative 1 **Preferred**	Alternative 1 would maintain the Big Snowies Wilderness Study Area much like it is today. The area would remain undeveloped and timber would not be harvested on a regulated basis. Both motorized and non-motorized semi-primitive recreation opportunities would be provided. Direct effects would be a loss of primitive recreation (wilderness) and timber management opportunities.
Alternative 2	Alternative 2 would recommend wilderness classification for the Big Snowies Wilderness Study Area. Wilderness designation would result in the area being managed in such a manner as to leave it unimpaired for future generations use and enjoyment. Timber and motorized recreation opportunities would be foregone.
Alternative 3	Alternative 3 would provide the highest levels of timber and range outputs. All of the study area would be developed. Semi-primitive recreation opportunities would be foregone. Wildlife security habitat would be reduced.
Alternative 4	Alternative 4 also provides high levels of timber and range outputs. About 85 percent of the study area would be developed. Most semi-primitive recreation opportunities would be foregone. Wildlife security habitat would be reduced.
Alternative 5	Alternative 5 would provide moderate levels of timber and range outputs. About 60 percent of the study area would be developed. Many semi-primitive recreation opportunities would be foregone.

DEIS
SECTION 2
MONTANA WILDERNESS STUDY ACT AREAS

CHAPTER I
PURPOSE AND NEED

Overview

This chapter describes the legislative framework, planning process, general description, and issues of the Middle Fork Judith and Big Snowies Wilderness Study Areas.

Montana Wilderness Study Act

On November 1, 1977, Congress passed the Montana Wilderness Study Act (Public Law 95-150). The Act requires the Secretary of Agriculture to study and make recommendations to Congress by 1982 on the wilderness suitability of nine separate National Forest areas in Montana containing 973,000 acres.

In the MWSA (Montana Wilderness Study Act), Congress specified that the nine areas be studied using the procedures in Section 3(b) and 3(d) of the Wilderness Act (Public Law 88-577). This procedure included:

- Determining suitability for wilderness preservation.
- Public notice and hearings.
- Notice to Governor of Montana, county governments, Federal Departments, and Agencies concerned.
- Sixty-day review period.
- Incorporate hearing and governmental agency and department comment in the report to Congress.

The nine MWSA areas include the following:

	Acres	Forest
Big Snowies	91,000	Lewis & Clark
Bluejoint	61,000	Bitterroot
Hyalite-Porcupine-Buffalo Horn	151,000	Gallatin
Middle Fork Judith	81,000	Lewis & Clark
Mount Henry	21,000	Kootenai
Sapphires	94,000	Bitterroot Deerlodge
Taylor-Hilgard	289,000	Beaverhead Gallatin
Ten Lakes	34,000	Kootenai
West Pioneer	151,000	Beaverhead
TOTAL	993,000	

In June of 1977, the Forest Service launched RARE II (Roadless Area Review and Evaluation) study. The purpose of RARE II was to identify all roadless and undeveloped areas in the National Forest System and recommend their allocations as either wilderness or nonwilderness. All of the nine MWSA areas were included in the RARE II inventory completed on October 1, 1977.

The RARE II process did not include public notice and hearings and their incorporation in the report to Congress. The Forest Service decided to include the MWSA areas in the RARE II process to the extent possible. Through the RARE II process, all MWSA areas were placed under the further planning recommedation until the remaining legislative requirements were completed.

In November, 1979 the Regional Forester decided to conduct a Regional study of three of the MWSA areas, with the remaining six to be analyzed in the respective Forest Plans. The two areas in the Lewis and Clark, the Middle Fork Judith and the Big Snowies, were analyzed in the Lewis and Clark Forest Plan process.

The purpose of this environmental impact statement is to display the environmental consequences that would result from implementing the proposed action for the Middle Fork Judith and the Big Snowies. The environmental consequences will be addressed in terms of the issues identified during the MWSA Public Workshops in September, 1979, as well as the other public issues associated with MWSA areas.

Planning Process

The planning process uses an interdisciplinary approach in developing the alternatives. This interdisciplinary approach was used throughout the planning process in analyzing the affected area, estimating the environmental effects, and writing the DEIS (Draft Environmental Impact Statement). The interdisciplinary team used during this process included specialists from the natural and social sciences and environmental design arts. Frequent interaction between team members ensured consideration of all resources and interests in the analysis and decisions documented in the DEIS. A complete listing of the make-up of the interdisciplinary team is contained in the planning record, "Lewis and Clark National Forest Work Plan," and in the List of Preparers, "Forest Plan Draft Environmental Impact Statement," Chapter V.

The planning process, outlined in implementing regulations of the National Forest Management Act, was followed to develop the proposed action. The planning actions, as specified in the regulations and used in the Forest Planning process, are:

1. Identification of issues, concerns, and opportunities
2. Development of planning criteria
3. Inventory of data and information collection
4. Analysis of the management situation
5. Formulation of alternatives
6. Estimated effects of alternatives
7. Evaluation of alternatives
8. Selection of the preferred alternative
9. Implementation
10. Monitoring and evaluation

Remaining Process

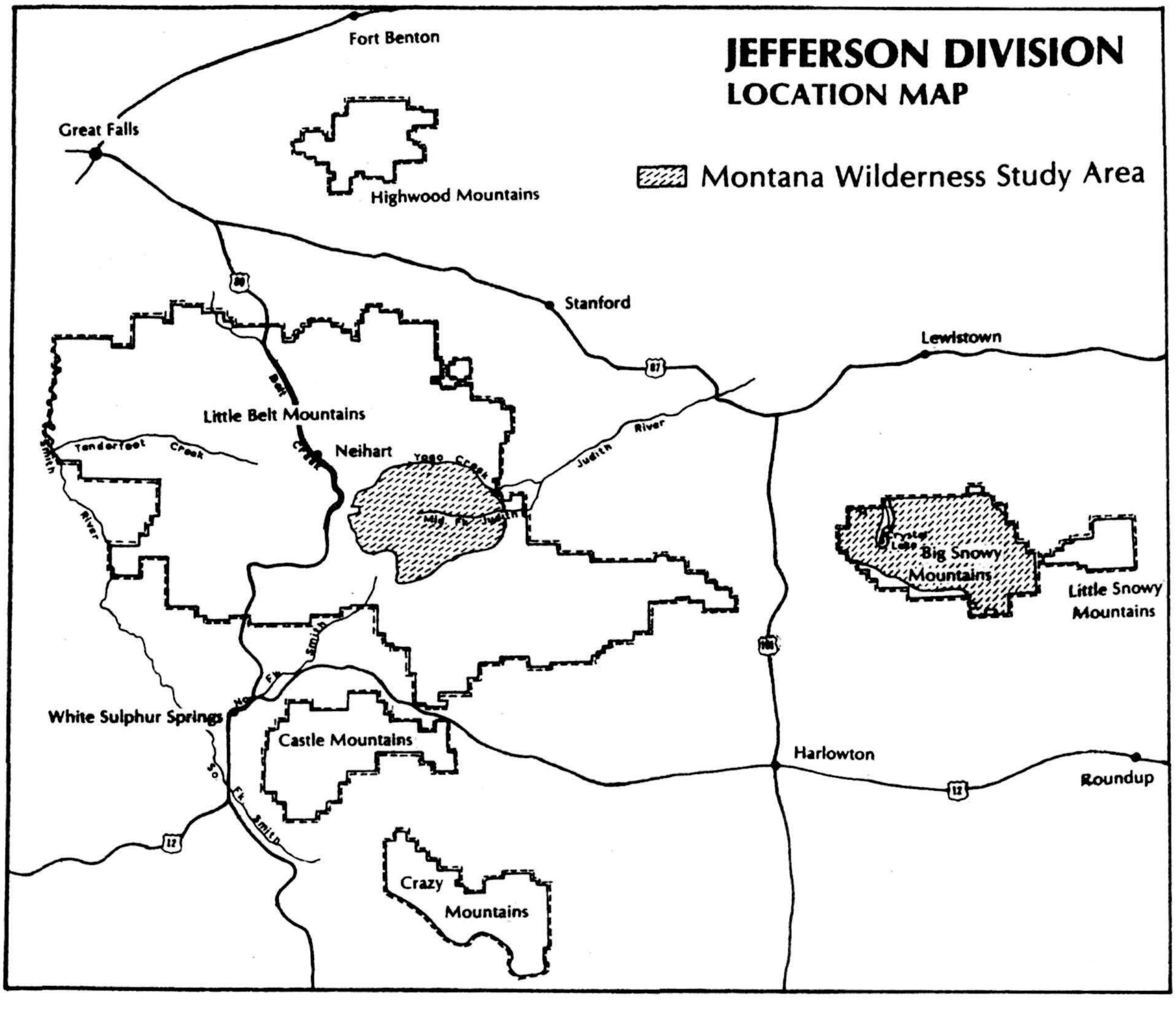
This DEIS has been prepared and circulated for comment after completion of planning actions 1 through 7. As part of planning action 7, a preferred alternative is shown in the DEIS and is the basis for managing the Middle Fork Judith and Big Snowies in the Proposed Lewis and Clark National Forest Plan. After the close of the comment period, planning actions 1 through 7 will be repeated to the extent necessary and a FEIS (Final Environmental Impact Statement) will be prepared, filed with the Environmental Protection Agency, and made available to the public.

Preliminary Recommendations

Any recommendations for the MWSA area in this statement and the Forest Plan are preliminary administrative recommendations. They will receive further review and possible modification in the offices of the Chief, the Secretary of Agriculture, and the President. Congress has reserved the right to make final decisions on wilderness designation.

Wilderness Study Management

Until Congress determines otherwise, the wilderness study areas will be managed, subject to existing private rights and uses, to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System until Congress determines otherwise.


JEFFERSON DIVISION
LOCATION MAP
▨ Montana Wilderness Study Area
Fort Benton
Great Falls
Highwood Mountains
89
Stanford
Lewistown
87
Little Belt Mountains
Belt Creek
Neihart
Yogo Creek
Judith River
Smith River
Tenderfoot Creek
Mid. Fk. Judith
Crystal Lake
Big Snowy Mountains
Little Snowy Mountains
191
Smith
No. Fk.
White Sulphur Springs
Castle Mountains
Harlowton
12
Roundup
So. Fk. Smith
12
Crazy Mountains

MIDDLE FORK JUDITH - GENERAL LOCATION

The Middle Fork Judith Wilderness Study Area is located in the Little Belt Mountains of central Montana, approximately 25 miles southwest of Stanford and 25 miles northeast of White Sulphur Springs. Originally composed of 81,000 acres, it was latter expanded to 92,000 acres as a result of the Roadless Area Review and Evaluation (RARE II). The Middle Fork Judith Wilderness Study Area is shown on Figure 1.1.

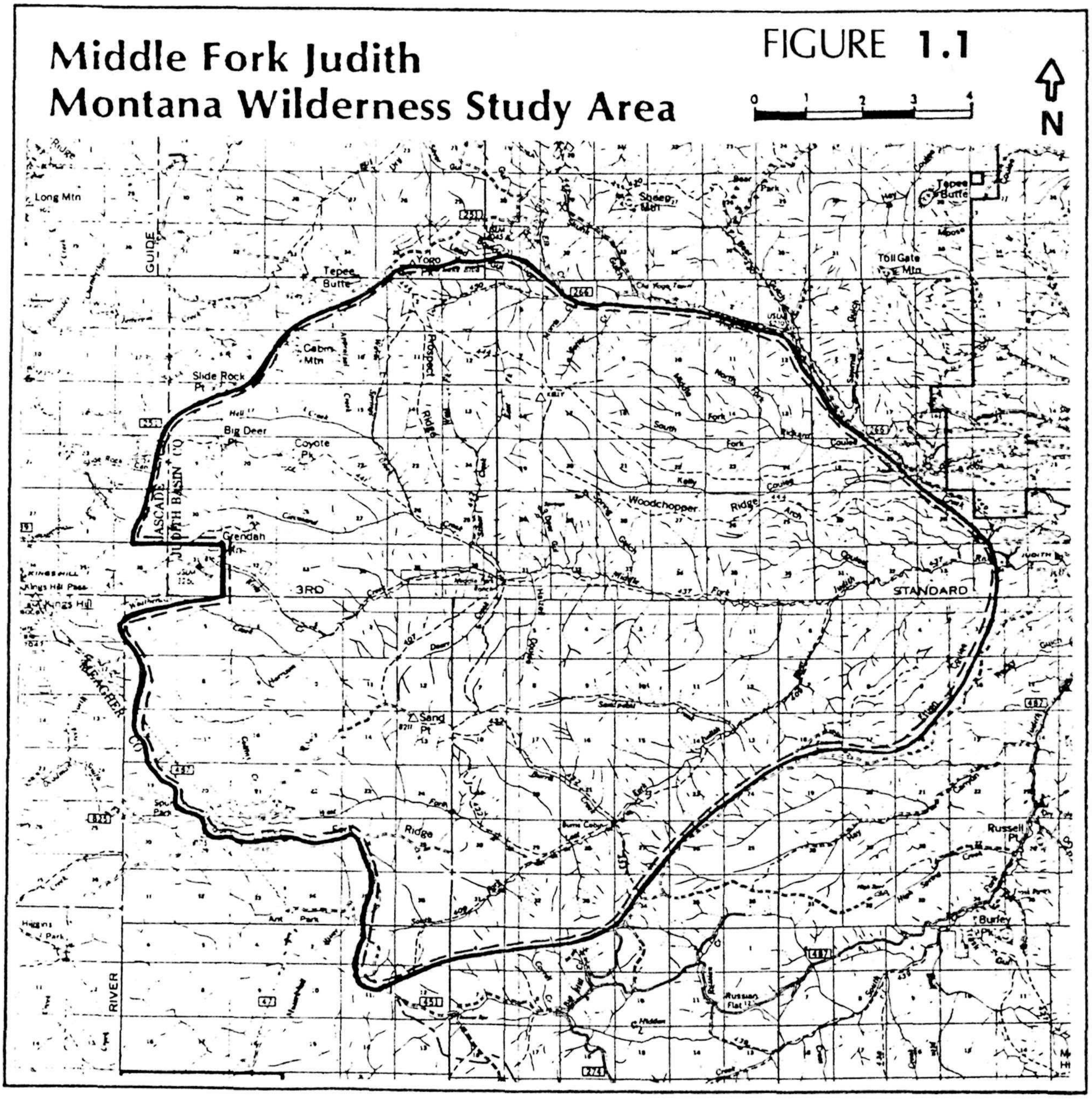

Middle Fork Judith
Montana Wilderness Study Area

FIGURE 1.1

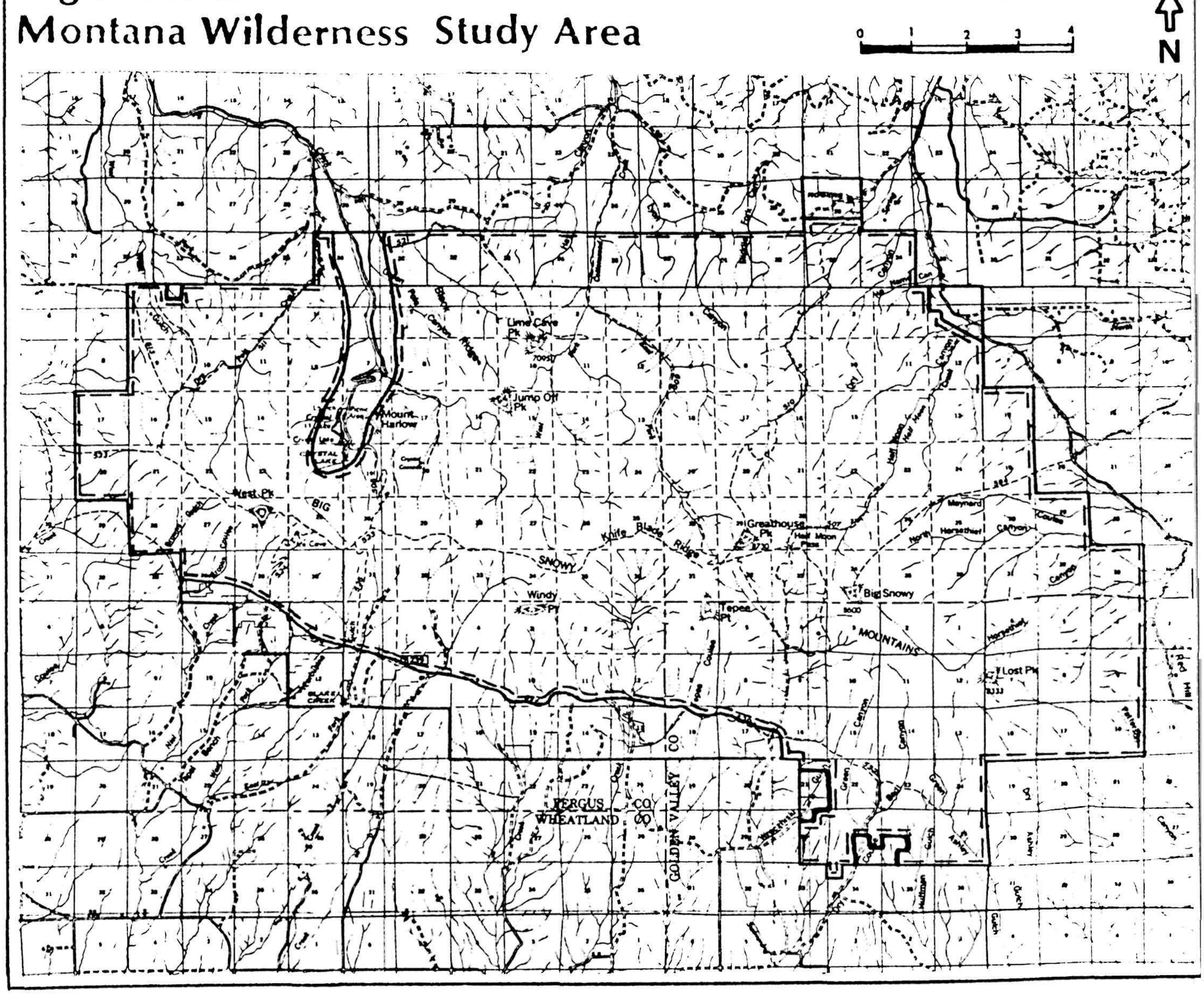
0 1 2 3 4
N
Long Mtn
GUIDE
Tepee Butte
Yogo Pk
Sheep Mtn
Bear Park
Tepee Butte
Toll Gate Mtn
Cabin Mtn
Slide Rock Pt
Prospect Ridge
Big Deer Pt
Coyote Pk
South Fork
Middle Fork
Woodchopper Ridge
CASCADE CO
JUDITH BASIN CO
Grendah Mtn
Kings Hill Pass
Kings Hill
3RD
STANDARD
MEAGHER CO
Sand Pt
Ridge
Burris Cabin
Russell Pt
Burley Pk
Russian Flat
Higgins Park
RIVER
251
266
487
437
451
274

BIG SNOWIES - GENERAL LOCATION

The Big Snowies Wilderness Study Area is located in the Big Snowy Mountains of central Montana, approximately 18 miles south of Lewistown and 26 miles northeast of Harlowton. Originally composed of 91,000 acres, the study area was expanded to 97,885 acres as a result of RARE II. The Big Snowies Wilderness Study Area is shown on Figure 1.2.

Big Snowies
Montana Wilderness Study Area

FIGURE 1.2


0
1
2
3
4
N
Lime Cave Pk
Jump Off Pk
Mount Harlow
Crystal Lake
Nest Pk
BIG
SNOWY
MOUNTAINS
Knife Blade Ridge
Greathouse Pk
Half Moon Pass
Windy Pt
Tepee Pt
Big Snowy
8600
Lost Pk
Maynard
Horsethief Canyon
FERGUS CO
WHEATLAND CO
GOLDEN VALLEY CO

ISSUE IDENTIFICATION

Issues for the study areas were raised by interested people attending twelve workshops relating to the study areas in September, 1979, in central and western Montana and by public comment mailed to the Northern Region after the workshops. Other resource issues and management concerns are specified in laws and regulations which direct National Forest management. Several issues were specified in the MWSA itself.

Issues from the public were identified through analysis of comments and identification of major concerns. Issues for all MWSA areas were developed together. How these issues could be resolved is discussed in Chapter II. Present uses and opportunities are discussed in Chapter III.

ISSUES

The issues identified for the Middle Fork Judith and Big Snowies Wilderness Study Areas are:

Recreation

- What is the amount and kinds of recreation opportunities the area presently supports or is capable of supporting?
- What is the current type and amount of motorized vehicle use and what is the potential for that use?
- How much need is there for the study areas to contribute to recreation opportunities for physically handicapped and elderly persons?
- What esthetic values does the area contain and how should these values be protected?

Wilderness

- What are the wilderness attributes of the study areas and to what extent are they needed for wilderness?
- What considerations should be given to a diversified National Wilderness Preservation System when proposing lands for wilderness?
- What other Federal lands are classified or proposed as wilderness or are under study as wilderness in the surrounding area and to what extent should they influence the classification of the study areas?

MWSA AREAS	Issues
Wildlife	- What are the principle game, nongame, and threatened and endangered species and what are the opportunities for habitat improvement?
Range	- What is the present range use of the areas and what is the potential for that use?
Timber	- What is the timber potential of the area and where is timber management appropriate?
	- What is the present use, location, and opportunities for cutting household firewood and what other energy needs, such as powerline corridors, should be considered?
Water - Soil	- What are the present conditions and uses of the areas watershed, and what is its relative sensitivity to development activities?
Minerals	- What is hardrock, oil, and gas potential of the area and how should they be managed for that potential?
Lands	- What is the present landownership pattern, current access, and use? What is the opportunity for acquisition or to manage potential wilderness in-holdings?
Facilities	- What type, condition, and amount of road and trail access do the areas contain and what is the potential for roaded form of access?
Protection	- What is the present condition and the potential for serious fire and/or insect and disease infestation? What are the current protection measures, and what measures are needed?
Economic Efficiency	- How important are economic efficiencies and impacts in determining the level and location of resource development in the study areas?
RPA	- What resources do the areas contain and how should the study areas resource outputs be allocated toward meeting the RPA (Resource Planning Act) program goals?
Human and Community Resources	- What considerations should be given to maintaining current employment levels for dependent communities?

DEIS
SECTION 2
MONTANA WILDERNESS STUDY ACT AREAS

CHAPTER II
ALTERNATIVE CONSIDERED

Overview

This chapter describes the alternatives for the MWSA areas analyzed in the planning process. It is divided into five parts:

- Alternative Formulation
- Alternative Description (Middle Fork Judith)
- Alternative Comparison (Middle Fork Judith)
- Alternative Description (Big Snowies)
- Alternative Comparison (Big Snowies)

Alternative Formulation describes the process used to formulate the alternatives. Alternative Description presents a narrative description of each of the alternative management philosophies considered in detail. Descriptions of alternatives eliminated from detailed analysis are included in this part. Alternative Comparison displays the results and outputs of alternatives analyzed in detail. These results and outputs are presented in graphic and narrative form.

ALTERNATIVE FORMULATION

ALTERNATIVE FORMULATION

Alternative formulation for MWSA was similar to that of the Forest Plan. Alternative formulation, planning action 5, results from a systematic set of interrelated actions beginning at the start of the planning process. In particular, these are planning actions 1 through 4, listed in Chapter I. The following discussion presents these actions in more detail.

Planning Action 1 - Identification of Issues, Concerns and Opportunities

Public issues and opportunities for management were identified through public involvement efforts, coordination with other Federal agencies, State agencies, and local governments. Other resource issues and management concerns are specified in laws and regulations which provide direction for National Forest Policy. Several issues were specified in the MWSA itself. These issues and concerns are listed in Chapter I. Details on the process used to develop issues, concerns, and opportunities are available in the planning record, "MWSA Workshop Analysis Summary".

Planning Action 2 - Development of Planning Criteria

Criteria were established to guide the planning process and management direction. Process criteria for the collection of inventory data, analysis of the management situation, and the formulation of alternatives were developed by the interdisciplinary team. Process criteria are documented in the planning record, "Proposed Criteria and Documentation".

Planning Action 3 - Inventory of Data and Information Collection

Using resource inventories, a comprehensive data base was formed, including landform, soils, wildlife, and vegetation information. A timber stand analysis specific to the MWSA areas was completed and used in the formulation of timber yield tables. Details on contents of the data base are contained in the planning record, "Data Base Components".

Planning Action 4 - Analysis of the Management Situation

The analysis of the management situation for the Forest included identification of feasible ranges of goods, services, and uses; projected use levels; potential to resolve issues and concerns; the feasibility of providing the levels of goods, services, and uses resulting from assigned RPA objectives. This analysis identified the opportunity to change management direction. The Middle Fork Judith and Big Snowies MWSA areas were included in the analysis.

Planning Action 5 - Formulation of Alternative

Alternatives listed different ways to address and respond to the major public issues, management concerns, and resource opportunities. Alternatives result from planning actions 1 through 4 and are documented in Section 2 of the planning record, "Alternatives".

ALTERNATIVE FORMULATION

MAJOR COMPONENTS USED TO FORMULATE ALTERNATIVES

FORPLAN - Analysis Areas

In evaluating alternatives, a comprehensive resource allocation computer model called FORPLAN was used. FORPLAN uses a mathematical algorithm called linear programming to determine the most efficient mix of management prescriptions to achieve a desired goal. In using FORPLAN, analysis areas must be formed and management prescriptions assigned to them. Analysis areas represent homogeneous areas of land formed from data stored in the data base, according to criteria from the interdisciplinary team.

MWSA alternatives were evaluated within the alternatives for the Forest Plan and never for the MWSA areas alone. Using FORPLAN to evaluate the alternatives for MWSA along with the alternatives for the Forest Plan allowed the total impacts on all resources to be measured Forest-wide. Three of the Forest Plan alternatives, A, B, and E, were evaluated with the MWSA areas treated both as wilderness and as available for commodity production.

Analysis areas were formed specific to the MWSA. Analysis area information is contained in the planning record, "Analysis Areas." Further information on FORPLAN model structure is in the planning record, "Lewis and Clark". "FORPLAN Model".

Management Prescriptions, Practices, and Standards and Guidelines

The NFMA regulations define management prescriptions as "management practices selected and scheduled for applications on a specific area to attain multiple use and other goals and objectives".

The interdisciplinary team reviewed the public issues and management concerns, used professional judgment, and consulted existing policy and legal requirements for guidance in developing multiple resource management prescriptions. This set of prescriptions portrays a broad range of management emphasis, intensities, management practices, standards and guidelines. The management standards and guidelines needed to accomplish the goals of a prescription include the necessary mitigation and resource coordination measures that are required by existing laws, regulations, and policies.

ALTERNATIVE FORMULATION

To fully explore appropriate, practical ways of managing the Forest for a variety of uses, the interdisciplinary team developed a set of rules (that included economic and cost effectiveness considerations) to guide the assignment of management prescriptions to various parts of the Forest (analysis areas). Within the rules and limitations of the model, the team considered all management prescriptions appropriate for each of the analysis areas on the Forest. The team based the assignment of management prescriptions on the land's inherent capability for resource production.

From this basic set of management prescriptions applied to the land, the Forest team developed yield and cost tables for use in modeling each prescription in the linear program (FORPLAN). These prescriptions were used for the development of both benchmarks and alternatives after some initial screening analysis to determine cost effectiveness.

All management prescriptions included for analysis and the rules for assigning them to analysis areas are listed in the planning record, "Management Prescriptions". Management prescriptions are summarized in Appendix C.

All management practices are listed in the planning record, "Management Practices".

Forest Management Guidelines are documented in the planning record, "Management Guideline Analysis Report", and summarized in Chapter IV of the Forest Plan.

Yield coefficients were developed for timber, recreation, range, wildlife, water, sediment, oil and gas, local roads, and insect and disease. Assumptions and methods of developing yield coefficients are available in the planning record, "Yield Coefficients".

Alternatives

An alternative is a combination of uniquely assigned management prescriptions that result in certain management direction, outputs, and effects. Different management prescriptions may be assigned to different areas. By varying the amount of acres assigned to management prescriptions, different alternatives can be developed. FORPLAN was used to determine the optimal mix of management prescriptions and acres for MWSA areas while meeting the objectives of each Forest alternative in a cost-efficient manner. Maps of the alternatives for the entire Forest including MWSA areas were prepared and reviewed by the interdisciplinary team. Constraints applied to alternatives were revised if the interdisciplinary team felt the land uses could not be implemented. These alternatives were then rerun through FORPLAN to determine the optimal mix of prescriptions and acres within the new constraints. Constraints for each of the alternatives are described in Appendix D.

ALTERNATIVE FORMULATION

HOW ECONOMICS WAS USED IN THE DEVELOPMENT OF ALTERNATIVES

Present Net Value

The goals of the alternatives were quantified to form different output levels for each alternative. Each alternative had as its FORPLAN objective function the maximization of PNV (present net value). PNV is the discounted benefits less discounted costs associated with providing all resource outputs to which monetary value can be assigned, including both market and selected non-market outputs. The optimal mix of prescriptions was chosen by FORPLAN that would meet these objectives in a cost-efficient manner. The use of PNV as the objective function ensured compliance with NFMA regulations which require that:

> "Each alternative will represent to the extent practicable the most cost-efficient combination of management practices examined that can meet the objectives established in the alternative."

The following section discusses how the Lewis and Clark National Forest satisfied this requirement.

Dollar costs and benefits were developed for each of the management prescriptions. All dollar costs and benefits were adjusted to reflect constant 1978 dollars.

Costs

The FORPLAN model included costs for most Forest management activities. Costs for the management prescriptions were determined in a three step process. First, costs were gathered for the various Forest management activities by MIH (Management Information Handbook) codes. These MIH activities had been grouped together to define management practices. The second step was to add the cost of the MIH activities that formed each management practice. Practices were defined for timber, range, wildlife, minerals, recreation, wilderness, soil and water, roads and trails, and protection. The third step was to add all the costs of the practices that were contained in a management prescription.

Arterial and collector road costs were not included in the FORPLAN model, but were used in the PNV calculation. Logging costs were the only costs assumed to increase in real terms during the first five decades.

Benefits

Dollar values were assigned to benefits from timber, range, recreation, and oil and gas leasing. Recreation benefits were not included in the model, but were included in the PNV calculation. The benefits assigned to each resource are as follows:

-- Timber values represent the value delivered at the mill. The value of timber at the mill, rather than average stumpage value, was used because site specific costs were estimated for all costs of timber management and harvest, including both Forest Service and private operator costs. Timber values range from $91.81 per thousand board feet ($352.70 per thousand cubic feet) to $440.80 per thousand board feet ($2,732.39 per thousand cubic feet) depending on the species and diameter class.

Timber values were assumed to increase in real terms during the first 5 decades. For the remaining periods, these values remained constant.

-- Range values were obtained from studies done by Economic and Statistics Services, USDA. For this Forest, the value is $11.69 per AUM (animal unit month).

-- Recreation values were obtained from RPA estimates of these values. Values for dispersed and developed recreation, wilderness recreation, and hunter recreation are $3.00, $8.00, and $21.00 per RVD (recreation visitor day), respectively. Recreation values are assumed to increase in real terms during the first 5 decades and thereafter remain constant.

-- Oil and gas values for leased values are $1.00 per acre per year. (This was increased by the Bureau of Land Management to $2.00 per acre per year in late 1981 but was kept at $1.00 per acre for comparative purposes.)

Importance of PNV

PNV for each acre was determined for each management prescription and timing choice using FORPLAN. FORPLAN was then used to evaluate alternatives through selection of prescriptions based on an objective function which maximizes PNV over a 150-year planning horizon for the Forest alternatives. For the MWSA alternatives, PNV was then separately calculated over a 50-year planning horizon.

HOW NET PUBLIC BENEFITS WERE USED IN THE DEVELOPMENT OF ALTERNATIVES

The interdisciplinary team considered net public benefits during alternative formulation. Net public represents the overall value to the Nation of all benefits, less all costs, irregardless of whether the costs and benefits are expressed in quantifiable (PNV) or qualitative terms (often subjectively measured). The interdisciplinary team considered both quantifiable and components of net public benefits and the tradeoffs that occur. For example, reducing PNV (due to constraints on the spacial distribution of timber harvest on the Little Belt Mountains) for elk hunting quality may have a higher net public benefit than not giving up the PNV and foregoing elk hunting quality. Alternatives were constructed to examine these tradeoffs and to enable decision makers to select a preferred alternative that maximizes net public benefit.

The specific PNV component of net public benefit is discussed in the previous section. The qualitative net public benefit components used in the MWSA alternative formulation process are:

Elk hunting quality
Semi-primitive recreation setting values

These quantitative components are further explained in the alternative comparison section along with several components identified after the alternatives were formulated.

Net Public Benefits

The interdisciplinary team evaluated alternatives to determine which one maximized net public benefit. Net public benefit is the overall value to the Nation of all benefits less all costs, whether they can be quantitatively valued or not. Net public benefit includes PNV plus all those outputs and effects that cannot be expressed in dollar terms, such as visual quality, enjoyment of wildlife, and clean air.

For further information on costs, benefits, and projected real cost and value indices, see the planning record, "Economic Data and Analysis".

OPPORTUNITY FOR CHANGE

OPPORTUNITY FOR CHANGE

The MWSA directs that the Middle Fork Judith and Big Snowies be studied for possible inclusion into the National Wilderness Preservation System. As part of this study, the Analysis of the Management Situation for the Forest identified opportunities to change management direction for individual resources. Additional analysis was done for the Middle Fork Judith and Big Snowies Wilderness Study Areas. Currently the areas are managed to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System until Congress determines otherwise. The following areas were examined for the opportunity to change from current direction.

Dispersed Recreation

Recreation opportunity is the projected capacity of an area to provide dispersed recreation based on the area's recreation setting. Current available dispersed recreation opportunity is 28,000 RVDS (Recreation Visitor Days) in the Middle Fork Judith and 20,600 RVDs in the Big Snowies. Current use in the Middle Fork Judith is 20,800 RVDs and 5,700 RVDs in the Big Snowies.

The maximum dispersed recreation opportunity available is 333,100 RVDs in the Middle Fork and 163,100 RVDs in the Big Snowies. It is attained by accessing these undeveloped lands. This causes a change in the recreation setting from semi-primitive to roaded natural appearing. This setting provides more dispersed recreation opportunity.

The least dispersed recreation opportunity available is 23,000 RVDs in the Middle Fork and 11,500 RVDs in the Big Snowies. This would occur under wilderness classification. Wilderness, by its nature, requires solitude and tranquility and takes place in a primitive recreation setting.

Wilderness

The maximum area in the two study areas which could be classified as wilderness is 189,885 acres, a total of the two study areas.

Wildlife

The current elk population is 1,200 animals in the Middle Fork Judith and 100 animals in the Big Snowies. The maximum elk population for these areas cannot be determined. Both areas contain little big game winter habitat. Elk are highly dependent on the adjacent private, state, and other Federal land for winter habitat. Winter habitat is the limiting factor for elk population in these areas.

OPPORTUNITY FOR CHANGE

Range

The current domestic grazing level in the Middle Fork is 900 AUMs Animal Unit Months and in the Big Snowies, 2,700 AUMs. Under maximum production, the Middle Fork could provide 1,500 AUMs and the Big Snowies, 3,700 AUMs.

Timber

The Middle Fork Judith has a standing volume of 460 million board feet. If all the available and capable lands were regulated for timber harvest, where rotation age is culmination of mean annual increment, 3.84 million board feet could be harvested each year.

The Big Snowies has a standing volume of 317 million board feet. If all the available and capable lands were regulated for timber harvest, where rotation age is culmination of mean annual increment, 3.41 million board feet could be harvested each year.

Minerals

The Middle Fork Judith has a high potential for hard rock minerals and low or no potential for oil and gas.

The Big Snowies has a low potential for hard rock mineral, and oil and gas.

ALTERNATIVE DESCRIPTION

ALTERNATIVES DEVELOPED

The next step after completing the analysis of the management situation was to develop alternatives. Effort was concentrated in developing a reasonable range of alternatives that could be analyzed within the limits set by the capability of the Forest and that were responsive to public issues and management concerns.

Alternative Testing

Even within an alternative considered for detailed analysis, usually more than one way was used to accomplish the objectives of the alternative. Different ways to meet those objectives were reviewed and tested by the Forest management team, interdisciplinary team, and other Forest personnel to ensure that the alternative met on-the-ground conditions and best fit the management objectives for the alternatives. Maximum PNV was used to test variations within alternatives to ensure economic efficiency.

Further information on all alternatives is on file at the Forest Supervisor's Office.

ALTERNATIVES ELIMINATED FROM DETAILED STUDY

The Forest developed and examined several alternatives which were eliminated from detailed analysis. These alternatives included:

Part Wilderness / Part Other Management

An alternative which would recommend the Middle Fork of the Judith as wilderness and manage the Lost Fork for commodities was examined. This alternative was not considered for detailed analysis because it substantially reduced the wilderness quality of the Middle Fork Judith with only a slight increase in commodity products.

An alternative which would manage the upper Middle Fork of the Judith for commodity products and recommend the rest of the study area for wilderness classification was examined. This alternative was eliminated from detailed analysis because most of the effects, except for wilderness classification, are similar to Alternative 6.

Boundary Changes

The boundary of each alternative was carefully examined to see if resource conflicts could be reduced and user opportunities increased.

The Middle Fork Judith contains 64 miles of primitive or low standard roads; these roads are found throughout the study area. Several areas are of known mineral interest. There are 1,154 acres of private land in the middle of the study area. Three areas have been identified where human activities are readily apparent. Little opportunity is available to reduce resource conflict or increase user opportunity by modifying the boundary.

The Big Snowies contains 50 miles of low standard roads. These roads penetrate almost all major drainages. The opportunities for boundary changes are small and would not significantly affect resource outputs or uses.

Special Management Designations

The use of special management area designation under 36 CFR 294 was considered. This designation is used to recognize unique areas with outstanding attributes which should have some type of National designation. Neither the Middle Fork Judith nor Big Snowies are perceived to have these attributes.

NFMA regulations through the Forest planning process provide the Regional Forester with the authority to establish management direction for all areas. This authority would be equal to special management designation.

ALTERNATIVES CONSIDERED IN DETAIL

The following alternatives were considered in detail:

Alternative 1 - Forest Plan Alternatives Current Plan & C (No Action Alternative)	The Middle Fork Judith Wilderness Study Area would be managed for semi-primitive recreation and wildlife habitat, especially elk habitat, through improvement practices. (See Figure M2.1)
Alternative 2 - Forest Plan Alternatives A-1, B-1, & E-1	The Middle Fork Judith Wilderness Study Area would be recommended for wilderness classification. (See Figure M2.2)
Alternative 3 - Forest Plan Alternative A-2, & E-2	The Middle Fork Judith Wilderness Study Area would be managed to provide a high level of commodity products to meet the RPA Recommended Program. (See Figure M2.3)
Alternative 4 - Forest Plan Alternative B-2	The Middle Fork Judith Wilderness Study Area would be managed to provide a moderate level of commodity products. (See Figure M2.4)
Alternative 5 - Forest Plan Alternative D	The Middle Fork Judith Wilderness Study Area would be managed for a low level of commodity products. (See Figure M2.5)
Alternative 6 - Preferred Alternative - Forest Plan Alternative F	The Upper Middle Fork Judith would be managed for commodity products; the remaining part of the area would be managed for semi-primitive recreation and wildlife habitat. (See Figure M2.6)

The allocation of land management emphasis by alternative is shown in Table M2.1. A summary of resource outputs for the alternatives is shown in Table M2.2.

☐ Activity within the next 50 years

▨ Activity between 50 & 150 years

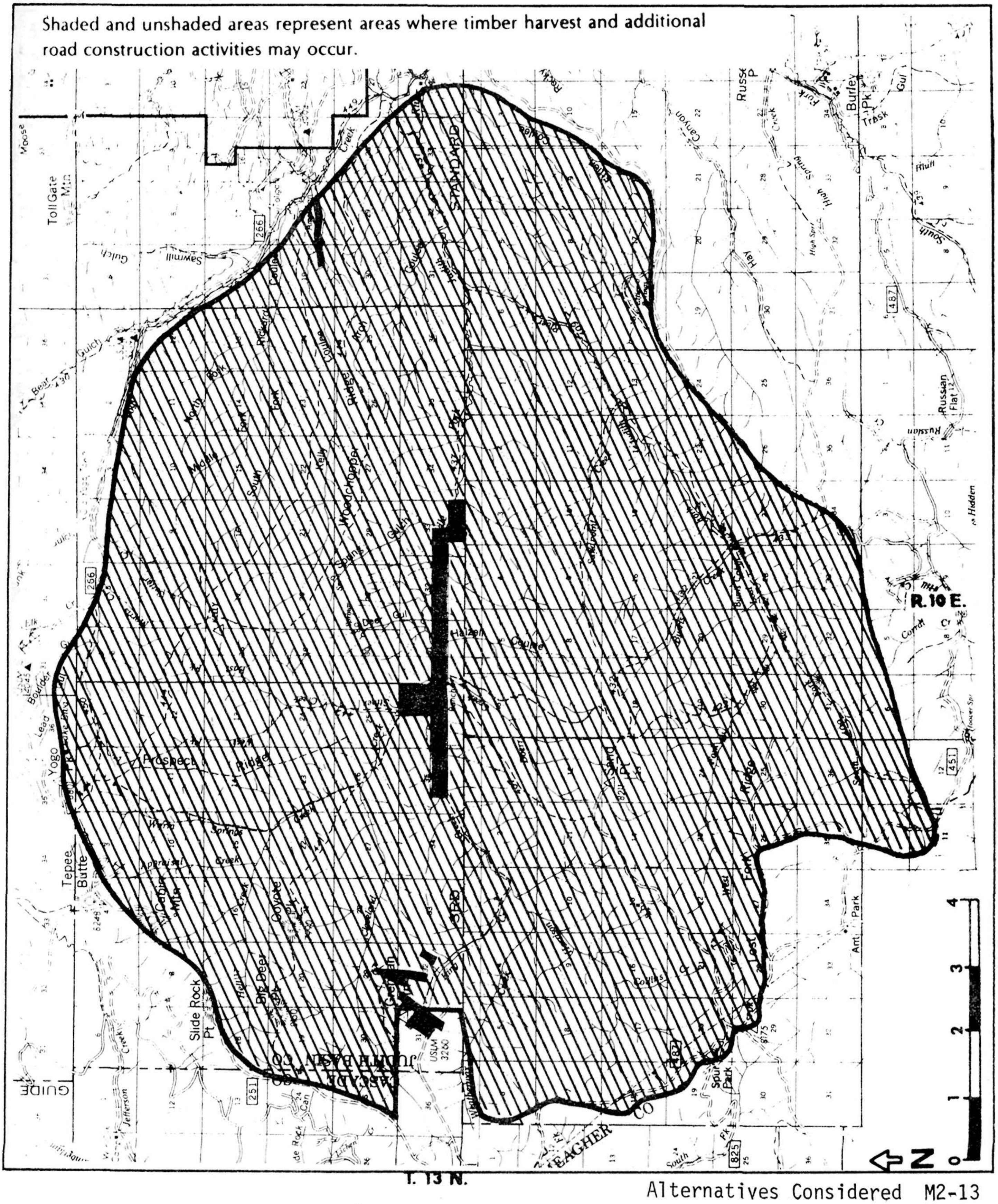
▨ No Activity 92,000 Acres

■ Wilderness

Figure M2.1

Alternative 1

Middle Fork Judith Montana Wilderness Study Area



Shaded and unshaded areas represent areas where timber harvest and additional road construction activities may occur.

Toll Gate Mtn
Sawmill
Gulch
Bear Gulch
STANDARD
Middle
North Fork
South Fork
Woodchopper Ridge
Pickford Coulee
Russian Flat
Russian
Hidden
R. 10 E.
Yogo
Prospect
Ridge
Boulder
Lead
Tepee Butte
Warm Springs
Apprasial Creek
Coyote
Big Deer
Slide Rock Pt
JUDITH BASIN CO.
CASCADE CO.
MEAGHER CO
Spur Park
Lost Fork
Ridge
Hazlett
Coulee
Burley Pk
Trask
High Spring
Hay Canyon
Artl Park
Jefferson
Creek
GUIDE
266
251
487
451
482
825
USLM 3260
0
1
2
3
4
N
T. 13 N.

☐ Activity within the next 50 years

▨ Activity between 50 & 150 years

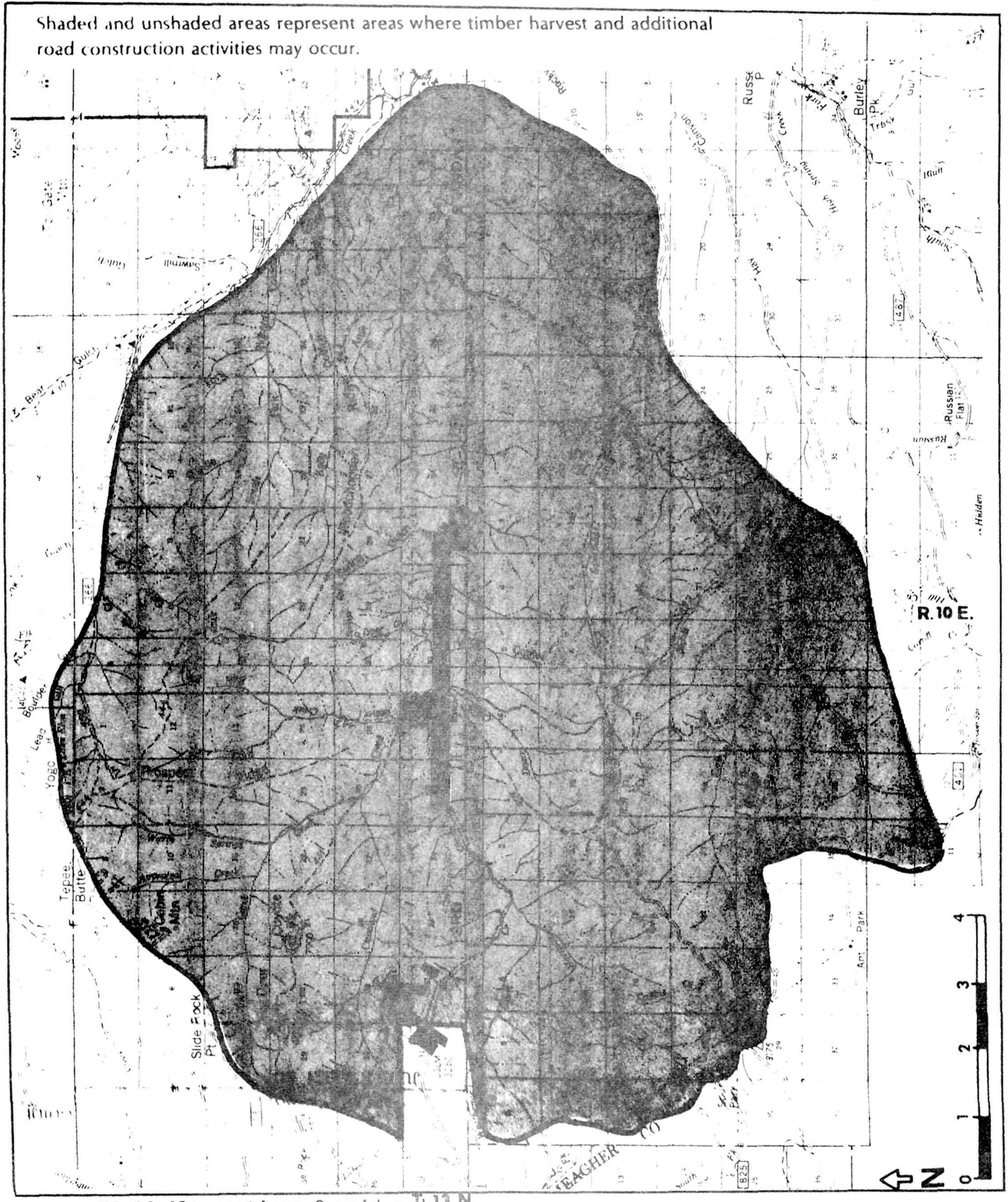
▧ No Activity

▩ Wilderness 92,000 Acres

Figure M2.2

Alternative 2

Middle Fork Judith Montana Wilderness Study Area



Shaded and unshaded areas represent areas where timber harvest and additional road construction activities may occur.

Rocky
Canyon
Russe
Burley Pk
Trask
High Spring Creek
Hay
Gate Mtn
Sawmill
Gulch
Bear Gulch
Creek
266
467
Russian Flat
Russian
Hidden
R.10 E.
Boulder
Lead
Yogo
Prospect
Tepee Butte
Slide Rock Pt
Ant Park
MEAGHER CO
825
T.13 N.
N
0
1
2
3
4

☐ Activity within the next 50 years
92,000 Acres

▨ Activity between 50 & 150 years

▧ No Activity

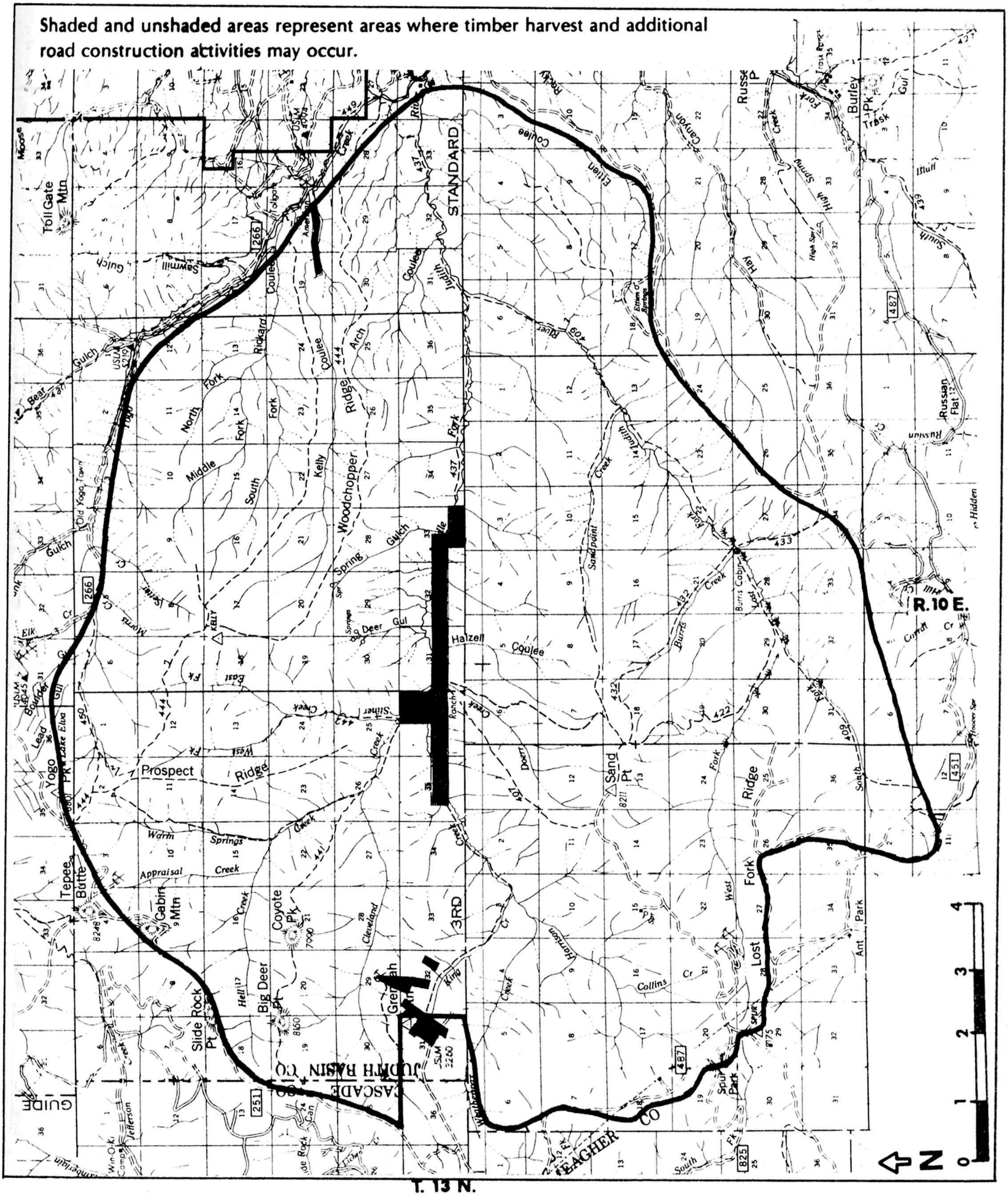
■ Wilderness

Figure M2.3

Alternative 3

Middle Fork Judith
Montana Wilderness Study Area

Shaded and unshaded areas represent areas where timber harvest and additional road construction acttivities may occur.



STANDARD
3RD
R.10 E.
T. 13 N.
Toll Gate Mtn
Yogo Pk
Tepee Butte
Cabin Mtn
Coyote Pk
Big Deer
Slide Rock Pt
Sand Pt
Burley Pk
Russian Flat
Middle Fork
North Fork
South Fork
Woodchopper Ridge
Arch Ridge
Prospect Ridge
Warm Springs Creek
Appraisal Creek
Hazell Coulee
Burris Creek
Lost Fork Ridge
Collins Cr
JUDITH BASIN CO
CASCADE CO
MEAGHER CO
GUIDE
266
251
487
451
825
0
1
2
3
4
N

Figure M2.4

Alternative 4

Middle Fork Judith
Montana Wilderness Study Area

☐ **Activity within the next 50 years**
83,680 Acres

▨ **Activity between 50 & 150 years**
8,320 Acres

▧ **No Activity**

■ **Wilderness**

Shaded and unshaded areas represent areas where timber harvest and additional road construction activities may occur.

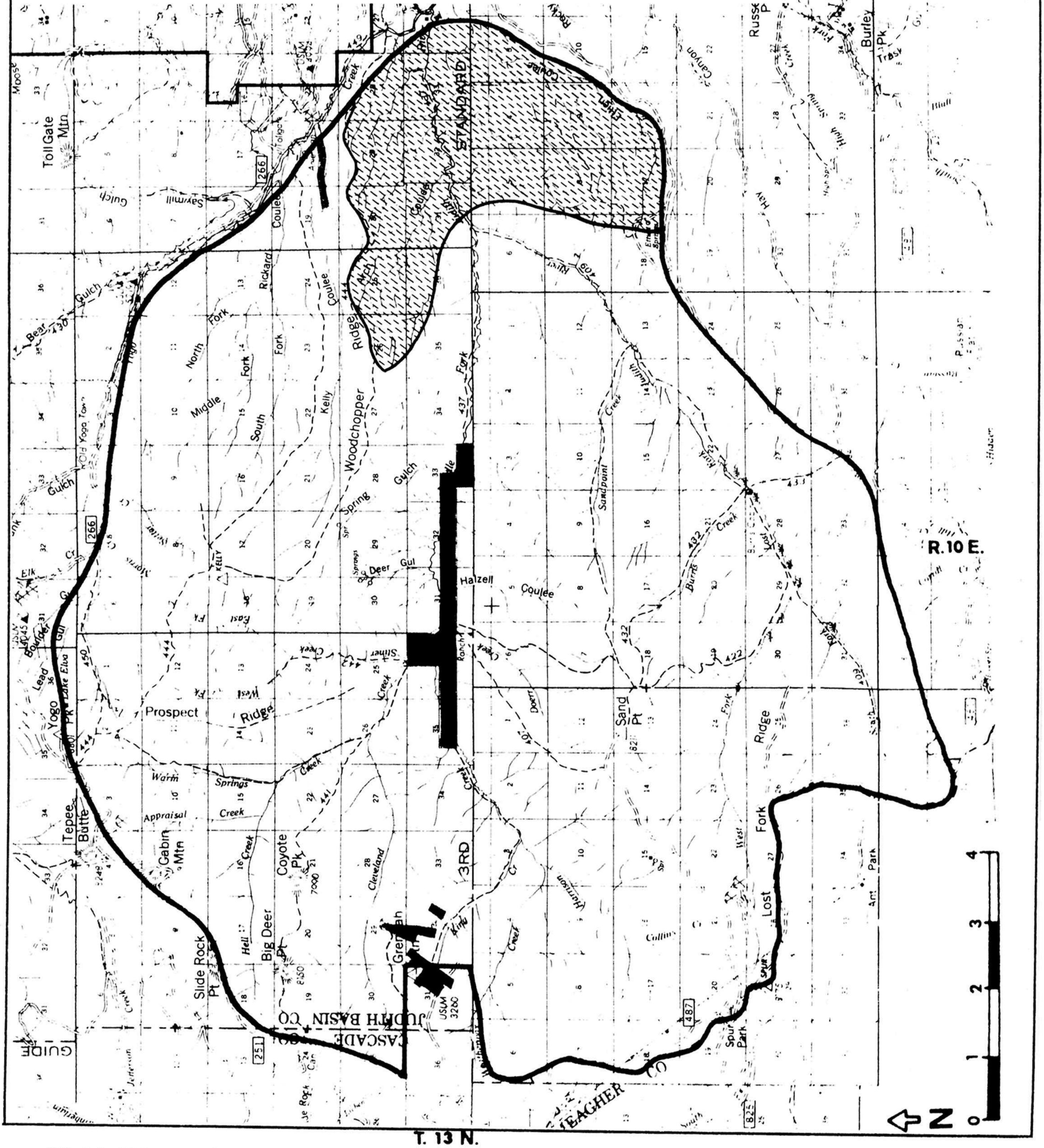

Toll Gate Mtn
Sawmill Gulch
Bear Gulch
Old Yogo Town
Elk
Boulder Gul
Lead
Yogo Pk
Lake Elva
Prospect Ridge
Warm Springs Creek
Appraisal Creek
Tepee Butte
Gabin Mtn
Slide Rock Pt
Hell Creek
Big Deer Pk
Coyote Pk
Cleveland
Greenough
USGM 3260
Rickard Coulee
North Fork
Middle Fork
South Fork
Kelly Coulee
Woodchopper Gulch
Ridge
Spring Gulch
Deer Gul
East Fk
West Fk
Creek
STANDARD
3RD
Middle Fork
Hazell Coulee
Sandpoint Creek
Burns Creek
Doerr
Sand Pt
Lost Fork
Ridge
West Fork
Lost
Spur Park
Ant Park
Collins
Harrison
Russell P
Burley Pk
Hay
High
Canyon
Coulee
R. 10 E.
T. 13 N.
JUDITH BASIN CO
CASCADE CO
MEAGHER CO
GUIDE
266
251
487
825
0
1
2
3
4
N

Figure M2.5

Alternative 5

☐ Activity within the next 50 years 38,240 Acres

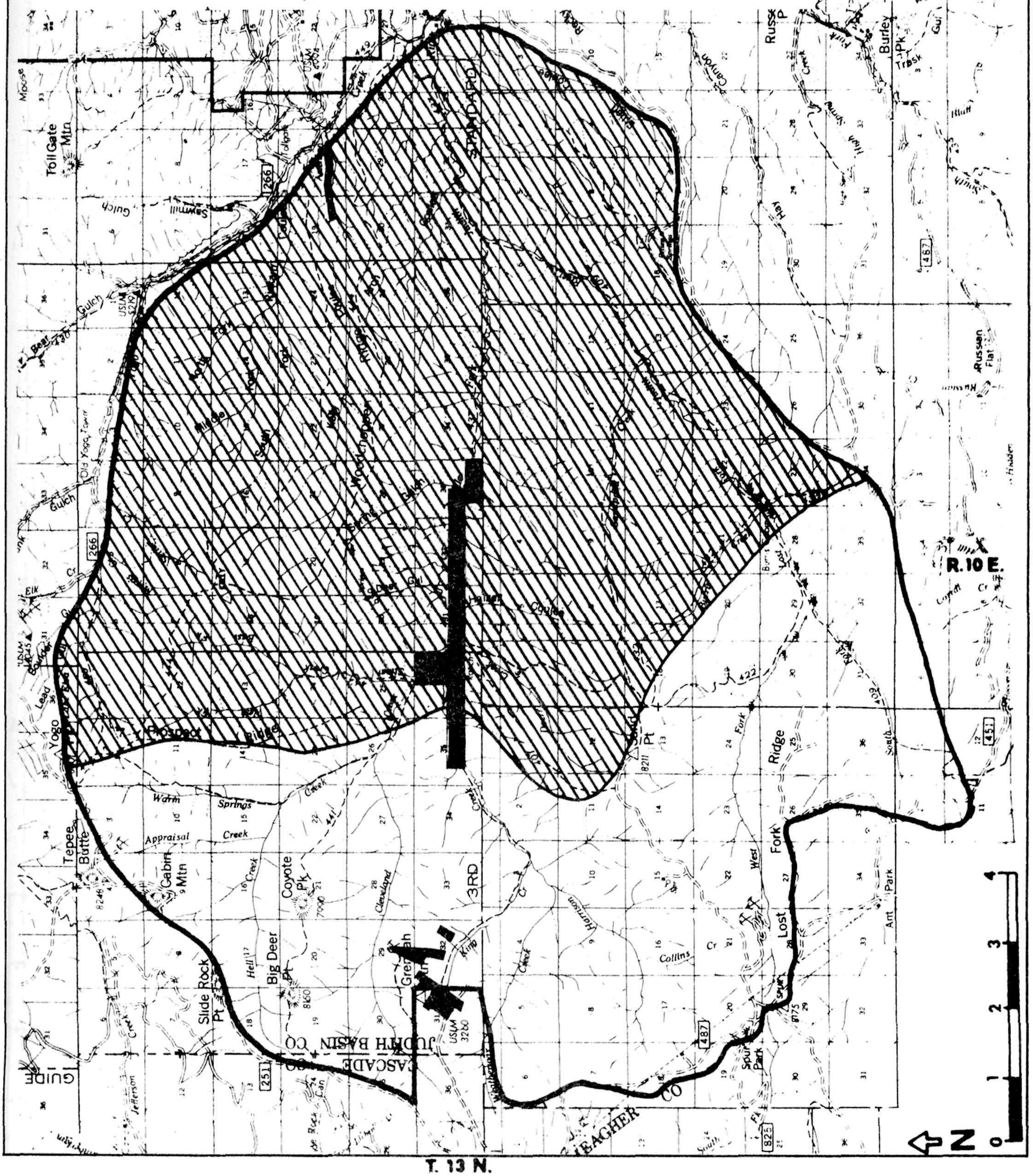
▨ Activity between 50 & 150 years

▨ No Activity 53.760 Acres

■ Wilderness

Middle Fork Judith Montana Wilderness Study Area

Shaded and unshaded areas represent areas where timber harvest and additional road construction activities may occur.


Toll Gate Mtn
Moose
Sawmill Gulch
Bear Gulch
STANDARD
Middle Fork
Old Yogo Town
Gulch
Elk
Lead
Yogo
Prospect Ridge
Tepee Butte
Warm Springs Creek
Appraisal Creek
Cabin Mtn
Coyote Pk
Big Deer Pt
Hell Cr
Slide Rock Pt
Cleveland
Grendah Mtn
3RD
King
JUDITH BASIN CO
CASCADE CO
GUIDE
Jefferson
Harrison
Collins Cr
MEAGHER CO
Spur Park
Lost Fork
West Fork
Ridge
Art Park
South
Russian Flat
R.10 E.
Burley Pk
Trask
Russ P
Canyon
Hay
8211 Pt
266
251
487
825
451
467
422
T. 13 N.
N
0
1
2
3
4

☐ **Activity within the next 50 years**
24,160 Acres

▨ **Activity between 50 & 150 years**

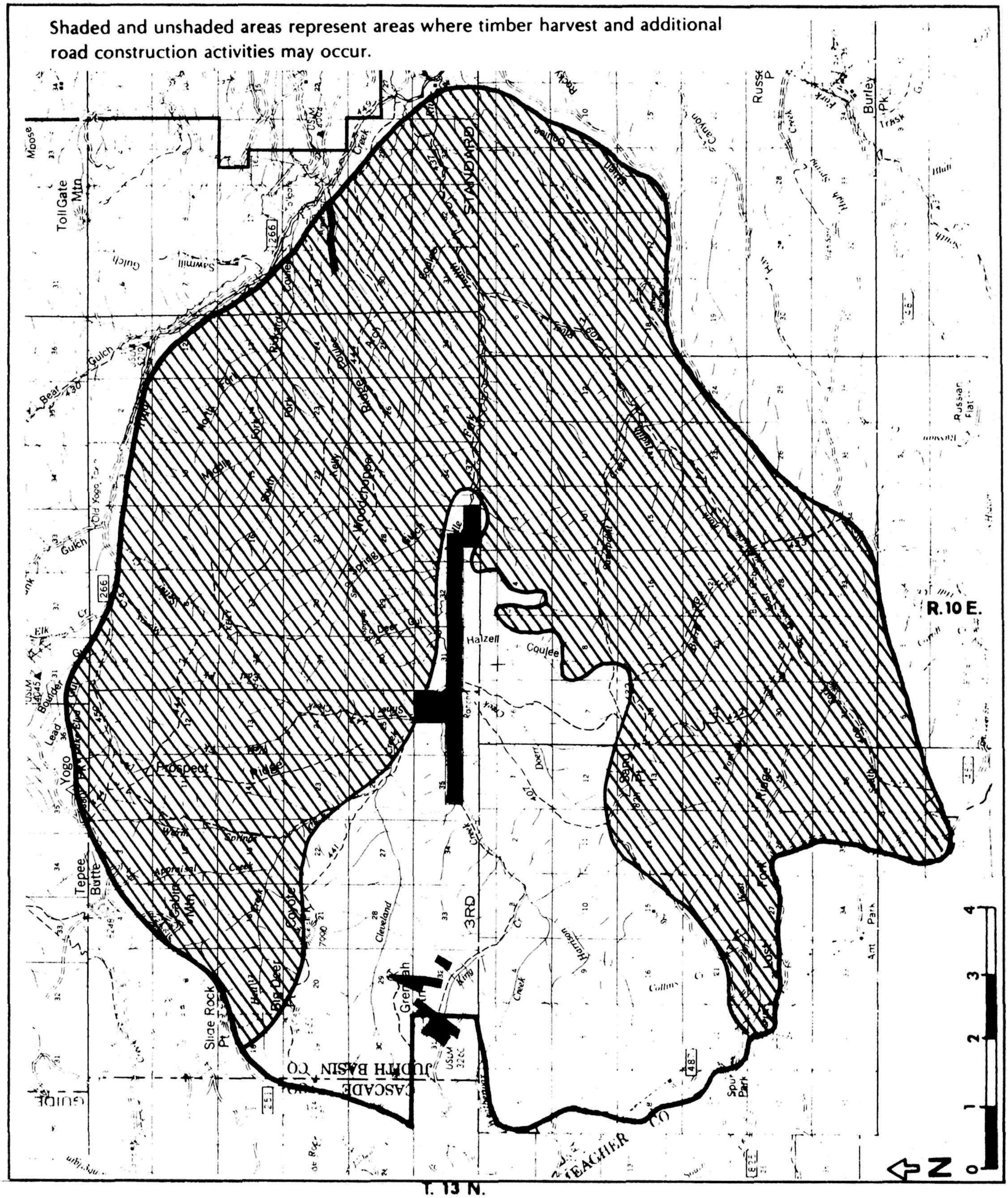
▨ **No Activity** 67,840 Acres

■ **Wilderness**

Figure M2.6

Alternative 6
(Preferred)

Middle Fork Judith
Montana Wilderness Study Area


Shaded and unshaded areas represent areas where timber harvest and additional road construction activities may occur.

Toll Gate Mtn
Moose
Sawmill
Gulch
Bear
Gulch
Old Yogo
Elk
Boulder
Lead
Yogo
Prospect
Ridge
Warm
Spring
Appraisal
Creek
Tepee
Butte
Big Deer
Slide Rock
Pt
Middle
Fork
Woodchopper
Ridge
STANDARD
Judith
Halzell
Coulee
Doerr
Cleveland
Grendah
King
Creek
Harrison
Collins
3RD
JUDITH BASIN CO
CASCADE
MEAGHER CO
Russian
Flat
Burley
Pk
Trask
Canyon
Russian P
Art Park
Spur Park
USM 4045
USM 3260
R. 10 E.
T. 13 N.
0
1
2
3
4
N

TABLE M2.1
ALLOCATION OF ACRES TO MANAGEMENT EMPHASIS BY ALTERNATIVE

MIDDLE FORK JUDITH

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	(Preferred) Alt. 6
Mininum Level Management	88140	0	33257	33570	83530	75696
Range Management	2436	0	4980	6770	2525	981
Timber Management	0	0	40681	42876	910	10412
Timber/Range Management	0	0	222	0	149	2064
Timber/Wildlife/ Visual Management	0	0	11576	7363	4885	836
Wildlife Management	1424	0	1284	1421	0	2011
Wilderness Management	0	92000	0	0	0	0

1/ A description of the FORPLAN prescriptions grouped into these management emphases is given in Appendix C.

TABLE M2.2
MIDDLE FORK JUDITH

SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE

Average Annual Output

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6 (Preferred)
Recreation Use Potential by 2030 (Base Year in Parentheses)	Thousand RVDs						
- Primitive (0)		0	23.0	0	0	0	0
- Semi-Primitive (28.0)		28.0	0	0	2.7	15.7	21.1
- Roaded Natural Appearing (0)		0	0	333.1	303.3	138.5	87.2
Recreation Setting by 2030 (Base Year in Parentheses)	Thousand Acres						
- Wilderness (0)		0	92.0	0	0	0	0
- Semi-Primitive (92.0)		92.0	0	0	8.3	53.8	67.8
- Roaded Natural Appearing (0)		0	0	92.0	83.7	38.2	24.2
Visual Quality Objectives	Acres						
- Preservation		0	92.0	0	0	0	0
- Partial Retention		92.0	0	0	8.3	53.8	67.8
- Modification		0	0	92.0	83.7	38.2	24.2
Wildlife							
- Habitat Improvement	Acre Equivalents						
-1982-1990		30	0	70	30	30	70
-2021-2030		30	0	100	30	30	70
- Elk Population Potential	Number						
-1982-1990		1200	1200	1200	1200	1200	1200
-2021-2030		1200	1200	1120	1120	1180	1180
- Elk Hunter Recreation	Hunter Days						
-1982-1990		8000	8000	7100	7700	7800	8000
-2021-2030		8000	8000	4500	4300	7200	7300
Range	AUMs						
- 1982-1990		900	900	900	900	900	900
- 2021-2030		900	900	980	940	980	940
Timber							
- Land Available, Capable, and Suitable	Acres	0	0	52.5	50.2	5.9	13.3
- Programmed Sales Offered	Million Board Feet						
- 1982-1990		0	0	10.6	3.9	3.5	0
- 1991-2000		0	0	0	6.0	0	1.1
- 2001-2010		0	0	7.8	12.1	2.3	1.1
- 2011-2020		0	0	7.2	.5	0	.5
- 2021-2030		0	0	2.7	4.5	.3	.5
- Reforestation (Natural and Planting)	Acres						
- 1982-1990		0	0	1270	440	400	0
- 1991-2000		0	0	0	670	0	120
- 2001-2010		0	0	870	1350	260	120
- 2011-2020		0	0	800	60	0	60
- 2021-2030		0	0	300	500	40	60

TABLE M2.2
MIDDLE FORK JUDITH

SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE
Average Annual Output

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6 (Preferred)
Minerals							
- Lands available for Oil and Gas Occupancy Leasing	Thousand Acres	1.3	0	1.3	1.3	1.3	1.3
Roads							
- Arterial and Collector to be constructed	Miles						
- 1982-1990		0	0	.9	.6	.6	0
- 1991-2000		0	0	0	.6	0	.6
- 2001-2010		0	0	.2	.2	.3	.3
- 2011-2020		0	0	.6	0	0	.2
- 2021-2030		0	0	0	0	.2	0
- Local	Miles						
- 1982-1990		0	0	13	4	4	0
- 1991-2000		0	0	0	7	0	1
- 2001-2010		0	0	9	14	3	1
- 2011-2020		0	0	8	1	0	1
- 2021-2030		0	0	3	5	1	1
Prescribed burning	Acres	10	0	60	30	40	50
Social/Economic							
- Change in Employment							
1982-1990	Person Years	0	0	140	50	45	0
2021-2030		0	0	35	60	5	5
Returns to U.S. Government 1/	Thousand Dollars						
- 1982-1990		6.6	1.6	218.6	84.6	76.6	6.6
- 2021-2030		6.6	1.6	60.8	96.8	12.7	16.7
Total Budget required to implement 1/	Thousand Dollars						
- 1982-1990		72.3	62.4	286.4	166.0	1416.4	72.4
- 2021-2030		72.3	62.4	124.1	158.4	242.7	319.5
Present Net Value @ 4% 1/	Thousand Dollars	4858.8	5406.4	43302.8	37778.9	10550.7	7099.8

1/ Values given in 1978 dollars

ALTERNATIVE COMPARISON

The "alternative comparison" shows how the alternatives are similar to and different from each other. Focus is on the public issues and management concerns (listed in Chapter 1) and how the alternatives addressed them. This part is organized by the Forest Service resource or support program elements. The Middle Fork Judith Study Area is discussed first followed by the Big Snowies Study Area.

Alternative 1

Alternative 1 would maintain the Middle Fork of Judith Wilderness Study Area much like it is today. The area would remain undeveloped and timber would not be harvested on a regulated basis. Both motorized and non-motorized semi-primitive recreation opportunities would be provided. Game and non-game wildlife habitat would not change. Elk and hunting opportunities would not change.

Alternative 2

Alternative 2 would recommend wilderness classification for the Middle Fork Judith Wilderness Study Area. Wilderness designation would result in the area being managed in such a manner as to leave it unimpaired for future generations use and enjoyment. Timber and motorized recreation opportunities would be foregone.

Alternative 3

Alternative 3 would provide the highest levels of timber and range outputs. All of the study area would be developed. Although elk numbers would decrease slightly, hunting recreation would be substantially reduced. Wildlife habitat would change and most habitat improvement would be directed at mitigating the effects of other programs.

Alternative 4

Like Alternative 3, Alternative 4 would also provide high levels of timber and range outputs. About 90 percent of the study area would be developed. Elk numbers would decrease slightly and hunting recreation would be substantially reduced. Most wildlife habitat improvement would be directed at mitigating other programs.

Alternative 5

Alternative 5 would provide moderate levels of timber and range outputs. About 40 percent of the study area would be developed. Hunting recreation would decrease although there would be only a small change in elk numbers. The lower canyon area would provide semi-primitive recreation opportunities.

Alternative 6 - Preferred

Alternative 6 would provide a low level of timber and a moderate level of range outputs. About 25 percent of the area would be developed. Both roaded natural appearing and semi-primitive recreation opportunities would be provided. Elk populations and hunting opportunity would decrease slightly.

RECREATION

Current available dispersed recreation opportunity is 28,000 RVDs of semi-primitive recreation in the Middle Fork Judith Study Area. Current use is about 10,800 RVDs semi-primitive, non-motorized recreation and 10,000 RVDs of motorized recreation. The study area contains no specific facilities for elderly or handicapped

Issues

- What are the amounts and kinds of recreation opportunities the area presently supports or is capable of supporting?
- What is the current type and amount of motorized vehicle use and what is the potential for that use?
- How much need is there for the study area to contribute to recreation opportunities for physically handicapped and elderly persons?

Comparison

Figures M2.7 and M2.8 display the projected dispersed recreation opportunity and recreation setting in 2030 by alternative.

FIGURE M2.7

PROJECTED DISPERSED RECREATION OPPORTUNITY

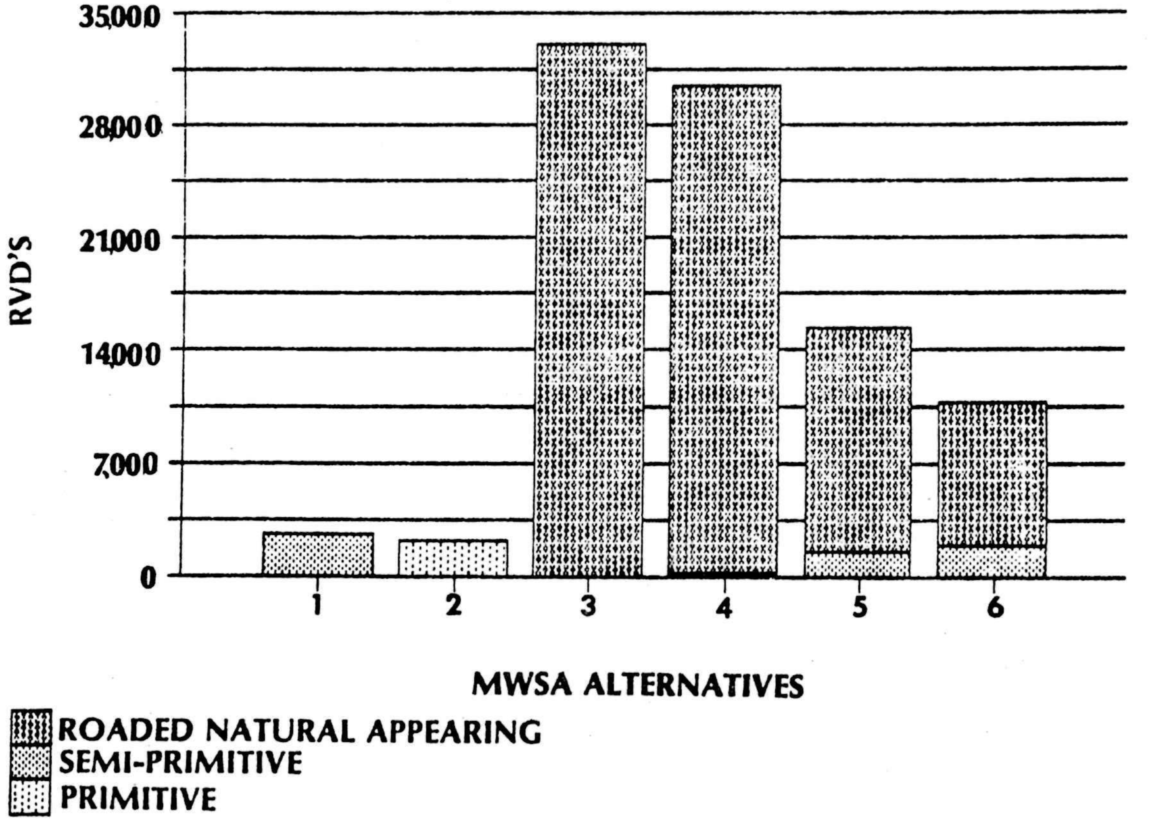
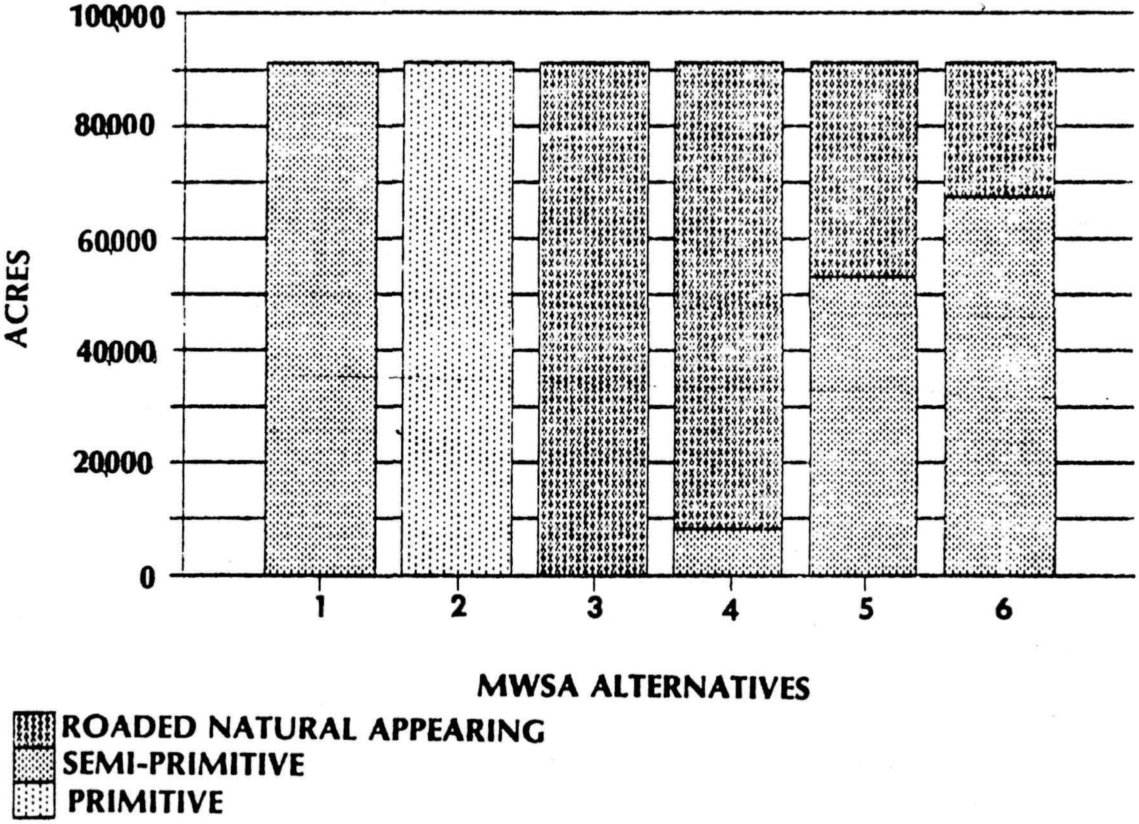


FIGURE M2.8
PROJECTED DISPERSED RECREATION SETTING



Alternative 1	The Middle Fork Judith Study Area would provide about 28,000 RVDs of semi-primitive motorized and non-motorized recreation.
Alternative 2	The area would provide 23,000 RVDs of primitive recreation (wilderness) opportunity. Under wilderness classification the area would be closed to motorized vehicles.
Alternative 3 - 4 - 5	As areas would be roaded, the recreation setting would change to a roaded natural appearing and use levels would increase. By 2030, Alternative 3 would provide 333,100 RVDs of roaded natural appearing recreation opportunity. Alternative 4 would provide 303,300 RVDs of roaded natural appearing recreation and 2,100 RVDs of semi-primitive recreation opportunities. Alternative 5 would provide 138,500 RVDs of roaded natural appearing recreation and 13,600 RVDs of semi-primitive recreation opportunity.
Alternative 6 - Preferred	By 2030, Alternative 6 would provide 87,200 RVDs of roaded natural appearing recreation opportunity and 17,200 RVDs of semi-primitive recreation opportunity.

VISUAL RESOURCES

The Middle Fork Judith Study Area is essentially a natural environment. The topography is varied and scenic. It is rolling and gentle in some areas and rugged in others. Changes in the natural landscape is reflected by the acres managed in a partially retained or modified setting.

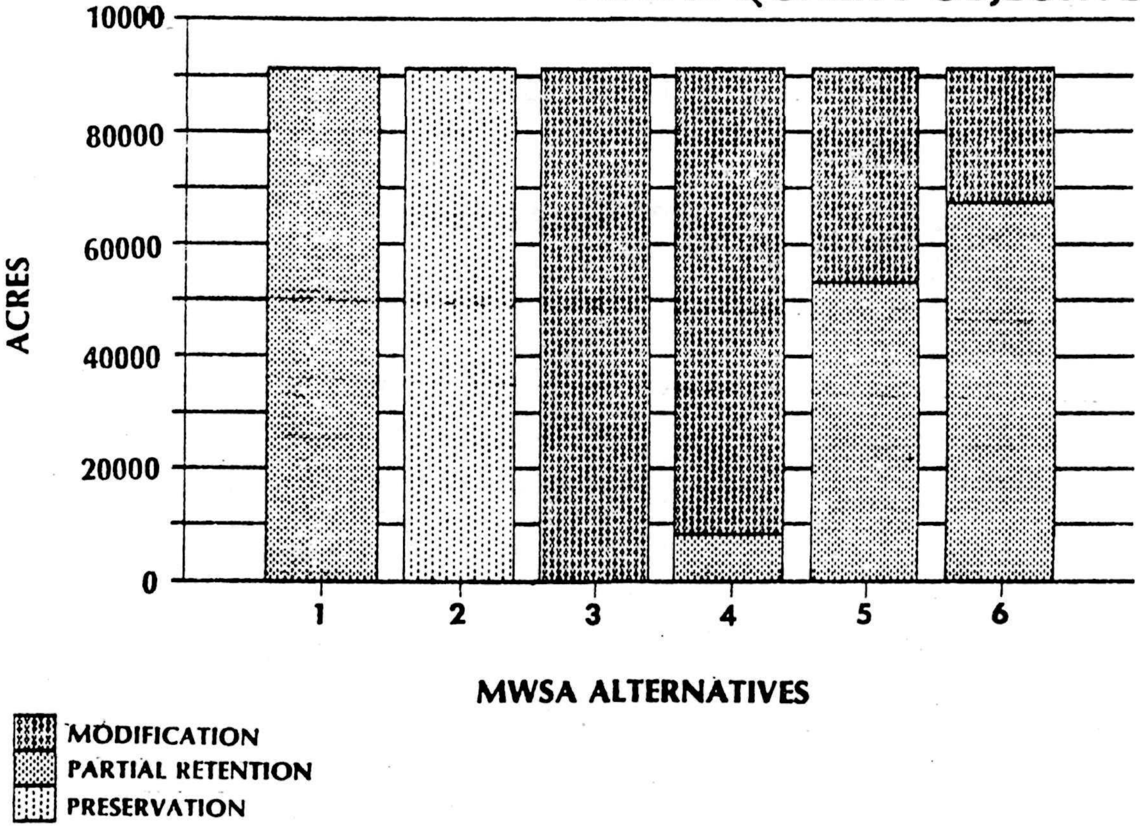
Issues

- What esthetic value does the area contain and how should these values be protected?

Comparison

Figure M2.9 shows the acres in each of the visual management objectives: preservation, partial retention, and modification.

FIGURE M2.9
VISUAL QUALITY OBJECTIVES



Alternative 1	The Middle Fork Judith Study Area would be managed to maintain the natural landscape of the area.
Alternative 2	Recommended wilderness classification would preserve the natural landscape of the study area.
Alternative 3	The natural landscape on all 92,000 acres would be modified.
Alternative 4	The natural landscape would be retained on 8,320 acres and modified on 83,680 acres.
Alternative 5	The natural landscape would be retained on 53,760 acres and modified on 38,240 acres.
Alternative 6 - Preferred	The natural landscape would be retained on 67,840 acres and modified on 24,160 acres.

CULTURAL RESOURCES

Cultural resources are managed under the Antiquities Act of 1906, the National Historic Preservation Act of 1966, the Archaeological and Historical Conservation Act of 1974, and the Archaeological Resource Protection Act of 1979.

Alternative 1 - 2	These alternatives would possess no development. The potential risk of damage to cultural resources would be slight.
Alternative 3	Generally, the risk of damage to cultural resources increases with development and access, so this alternative would possess the greatest risk to the cultural resources. Project work would continue to require inventory of sites and implementation of appropriate mitigating measures.
Alternative 4-5 6 - Preferred	These alternatives would possess moderate development. Areas allocated to intensive management activities would have the greatest risk. Project inventory and evaluation would continue.

WILDERNESS

National Forest System Wilderness is managed under the Wilderness Act of 1964, and the Code of Federal Regulations - Title 36 Part 293 - Wilderness and Primitive Areas - to preserve its natural condition. Wilderness study areas are managed to protect their wilderness character until Congress decides on their classification.

Issues

- What are the wilderness attributes of the study areas and to what extent are they needed for wilderness?

- What considerations should be given to a diversified National Wilderness Preservation System when proposing lands for wilderness?

- What other Federal lands are classified or proposed as wilderness or are under study as wilderness in the surrounding area and to what extent should they influence the classification of the study areas?

WARS

Wilderness quality is reflected by the WARS (Wilderness Attribute Rating System). The 28-point rating system evaluates the area on natural integrity, apparent naturalness, solitude opportunity, and primitive recreation setting. Middle Fork Judith received a rating of 22 under this system. This rating reflects the disruption of natural integrity and lack of opportunities for solitude because of primitive roads throughout the area.

Unique Ecosystem & Wildlife Species

In the RARE II analysis (Step 3), the Middle Fork Judith not selected to fill a target for ecosystem or wilderness associated wildlife species representation.

Relationship to Other Wilderness Areas

Within 250 miles of the Middle Fork Judith Study Area are 2.8 million acres of classified wilderness. There are also several areas which are being studied for possible wilderness classification by the Forest Service and Bureau of Land Management. The Middle Fork Judith would provide weekend visitation opportunities from the population centers of Great Falls, Lewistown, and Helena.

Comparison

Table M2.2 displays the acres of recommended wilderness by alternative. Primitive recreation takes place within classified wilderness and this opportunity is also shown in the table.

MIDDLE FORK JUDITH Alternative Comparison

Alternative 1	The Middle Fork Judith would be managed as a wilderness study area. The area's character would be protected.
Alternative 2	Wilderness classification would add 92,000 acres to the National Wilderness Preservation System.
Alternative 3	The opportunity for wilderness classification would be foregone on all 92,000 acres.
Alternative 4	The opportunity for wilderness classification would be foregone on 83,680 acres. The opportunity would be retained on 8,320 acres.
Alternative 5	The opportunity for wilderness classification would be retained on 53,760 acres. The opportunity for wilderness classification would be foregone on 38,240 acres.
Alternative 6 - Preferred	The opportunity for wilderness classification would be retained on 67,840 acres. The opportunity for wilderness classification would be foregone on 24,160 acres.

WILDLIFE AND FISH

A wide variety of wildlife use the Middle Fork Judith Study Area. The study area provides habitat for elk, mule deer, grouse, and black bear. Limited numbers of white-tailed deer and mountain lion are found in portions of the area. Non-game species include wolverine, lynx, golden eagle, and prairie falcon. The Middle Fork and its main tributaries provide over 29 miles of fisheries for cutthroat and rainbow trout.

Opportunities are available to maintain or improve spring/fall ranges for elk and mule deer at lower elevations in the eastern portion of the area. Some limited opportunities for fish habitat improvement also exist on the larger stream.

Issues

- What are the principle game, nongame, and threatened and endangered species and what are the opportunities for habitat improvement?

Comparison

Figures M2.10 and M2.11 display elk populations and wildlife habitat improvement for the first and fifth decades by alternative.

FIGURE M2.10

ELK POPULATION

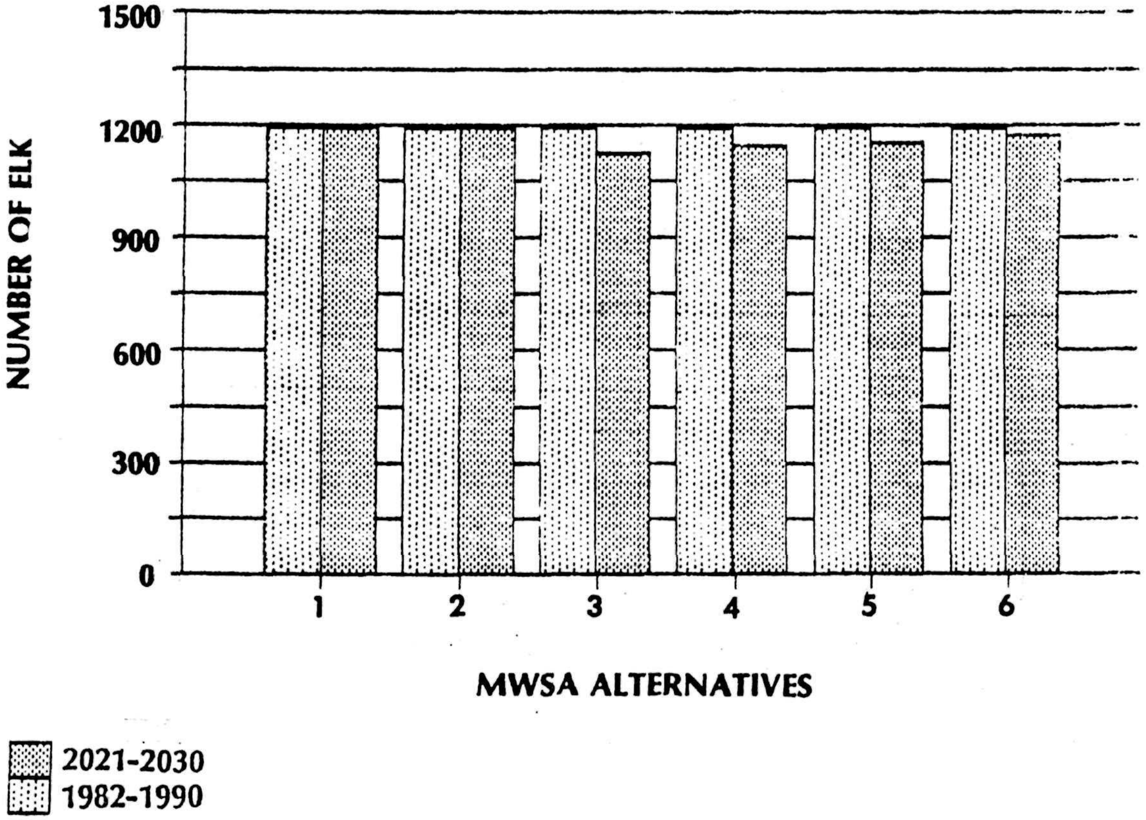
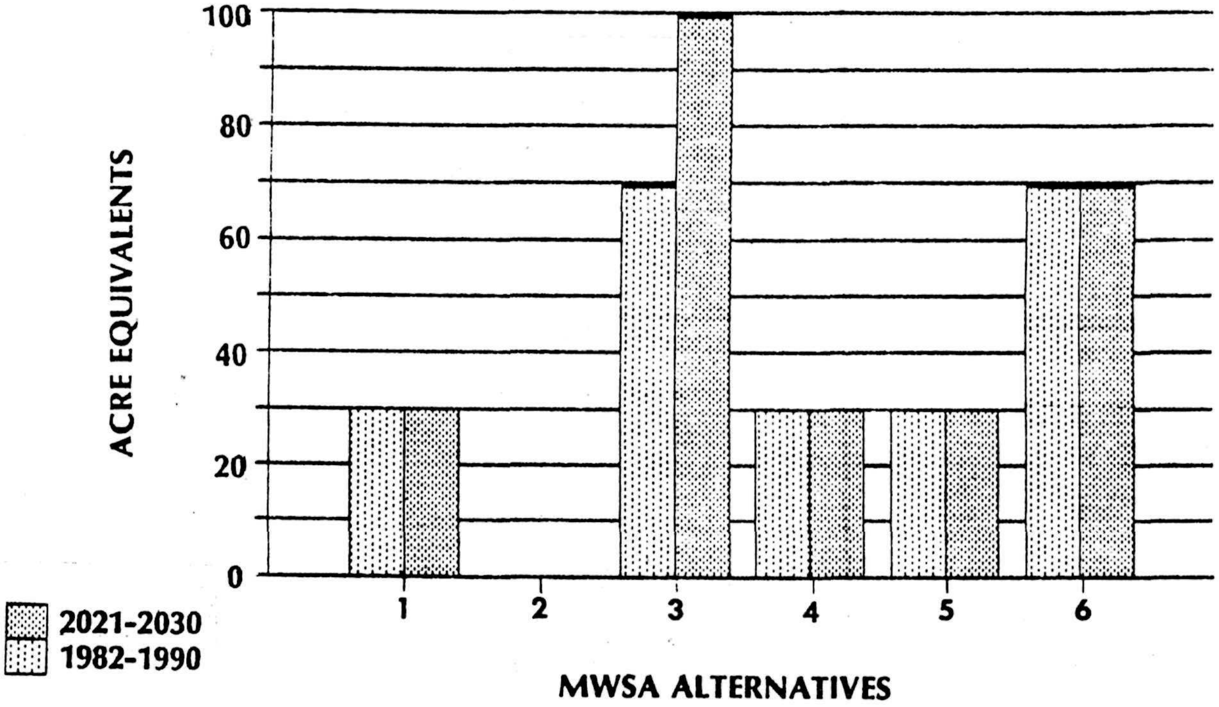


FIGURE M2.11

WILDLIFE HABITAT IMPROVEMENT



Alternative 1	This alternative would favor animals that prefer late successional vegetation. Security habitat for elk would be maintained. Elk population levels and hunting opportunities would not change. Fire and other vegetative manipulation would be used to improve spring and fall elk habitat. These areas would be used by animals that prefer early successional vegetation.
Alternative 2	Native wildlife species and their habitat are an integral part of the wilderness resource. Management of wildlife and wildlife habitat would be secondary to management of the wilderness resource. Wilderness classification tends to favor animals that prefer late successional vegetation. Elk population levels and hunting opportunity would not change.
Alternative 3	This alternative would favor animals that prefer early successional vegetation. Security habitat for elk would be substantially reduced and population would decrease by 170 animals. This decrease may be partially offset by road closures. Hunting opportunity would decrease. Elk migration routes to the Judith Game Range may be disrupted. This may shift wintering elk on to other adjacent private lands.

Alternative 4

This alternative would provide habitat for animals that prefer early and late successional vegetation. Elk population would decrease by 50 animals. Hunting opportunity would decrease. There would also be a decrease in hunting opportunity.

Alternative 5

This alternative would favor animals that prefer late successional vegetation. Elk security habitat would be reduced on 8,320 acres. The elk population would decrease by 40 animals. Hunting opportunity would decrease slightly.

Alternative 6 - Preferred

This alternative would provide security habitat for elk in the Lost Fork, Wood Chopper Ridge, and Lower Middle Fork of the Judith. These areas would be used by animals that prefer late successional vegetation. Elk security areas in the upper Middle Fork would be reduced. Elk populations would decrease by 20 animals. Hunting opportunity would decrease slightly. This may be partially offset by road management.

The upper Middle Fork would provide habitat for animals that prefer early successional vegetation. Fire and other vegetation manipulation would be used to improve spring and fall elk habitat. These areas would be used by animals that prefer early successional vegetation.

RANGE

The study area contains approximately 9,800 acres of suitable domestic livestock range. Presently, 900 animal unit months (AUMs) domestic livestock grazing are permitted. The forage in the study area plays an important part in rounding out local ranch operations, as well as providing feed for big game animals, particularly elk.

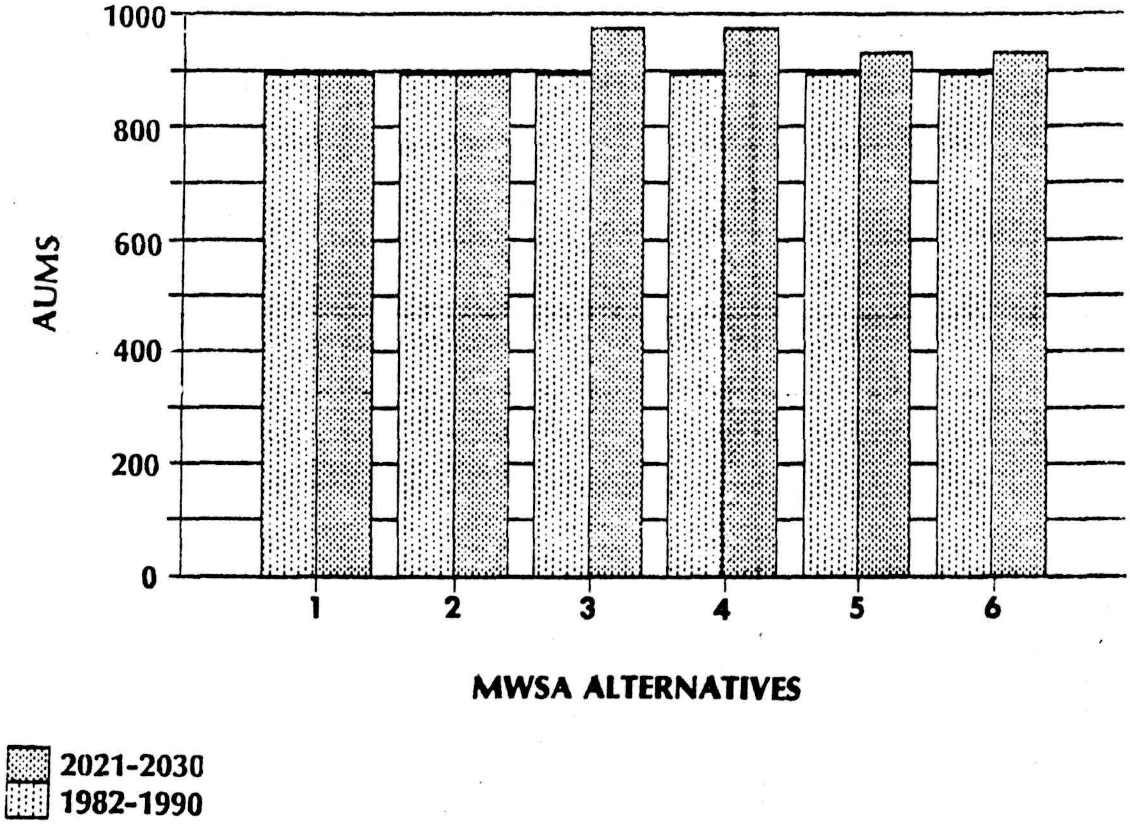
Issues

-What is the present range use of the areas and what is the potential for that use?

Comparison

Figure M2.12 displays the number of AUMs provided for domestic livestock grazing for the first and fifth decades by alternative.

FIGURE M2.12
RANGE



Alternative 1 - 2	Livestock grazing would not change.
Alternative 3 - 4	Domestic livestock use would increase by 80 AUMs.
Alternative 5 - 6 - Preferred	Domestic livestock use would increase by 40 AUMs.

TIMBER

Approximately 53,500 acres or 59 percent of the area is classified as commercial forest land. The lower elevations and foothills of the study area are blanketed with Douglas fir; at higher elevations, lodgepole pine is predominant. Present use for firewood cutting in the Middle Fork Judith is low due to limited and difficult access.

Issues

- What is the timber potential of the area and where is timber management appropriate?

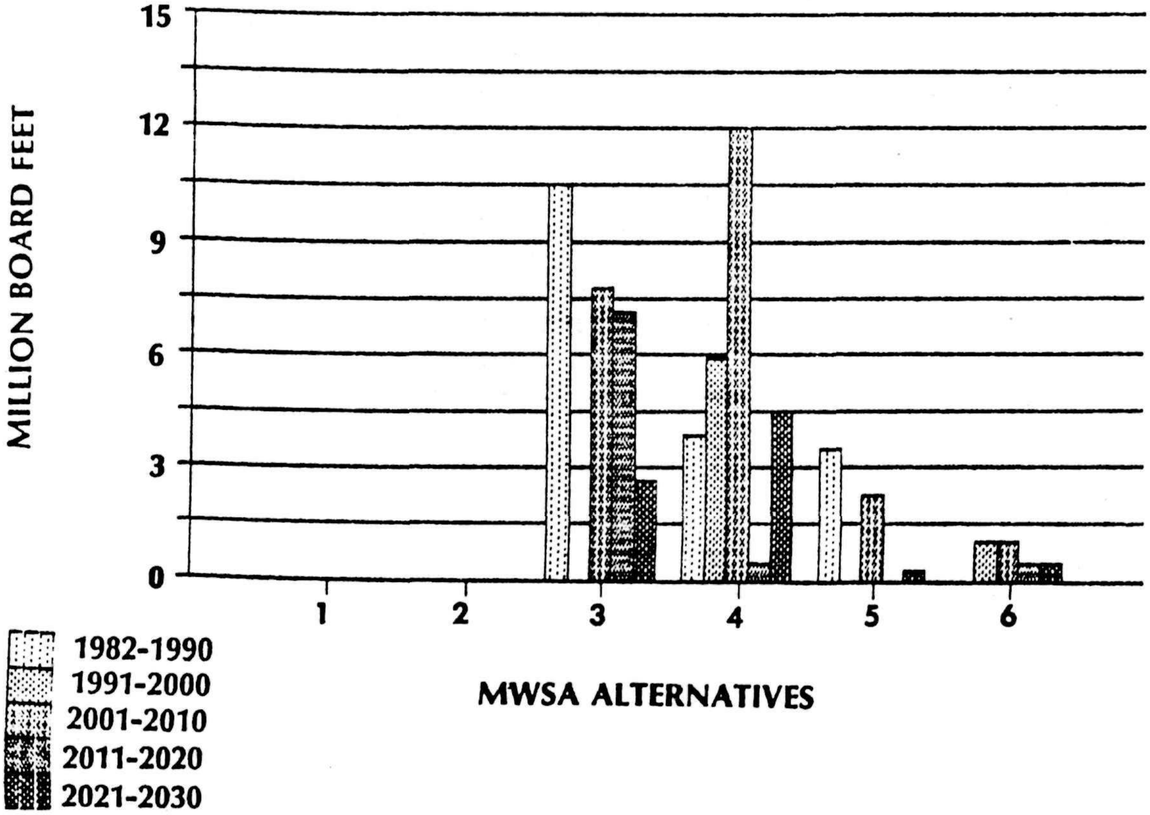
- What is the present use, location, and opportunities for cutting household firewood and what other energy needs, such as powerline corridors, should be considered?

Comparison

Figure M2.13 displays the harvest volumes for five decades by alternative..

FIGURE M2.13

ANNUAL TIMBER HARVEST PROGRAM



Alternative 1	Under this alternative, no timber would be harvested. Firewood removal would remain the same.
Alternative 2	The Wilderness Act prohibits timber harvest. Trees would not be cut for nonwilderness purposes, with the exception of prospecting, mining, and insect and disease control.
Alternative 3	Under this alternative, about 283 million board feet of timber would be harvested during the 50-year planning period. By 2030 approximately 2.7 million board feet would be harvested annually. Additional opportunities would be available for firewood removal.
Alternative 4	Under this alternative, about 270 million board feet of timber would be harvested during the 50-year planning period. By 2030, approximately 4.5 million board feet would be harvested annually. Additional opportunities would be available for firewood removal.
Alternative 5	Under this alternative, about 61 million board feet of timber would be harvested during the 50-year planning period. By 2030, approximately 0.3 million board feet would be harvested annually. Additional opportunities would be available for firewood removal.
Alternative 6 - Preferred	Under this alternative, about 32 million board feet of timber would be harvested over the 50-year planning period. No timber would be harvested the first decade. By 2030, approximately 0.5 million board feet would be harvested annually. Some additional opportunity would be available for firewood removal.

SOILS AND WATER	Watershed condition in the study area is generally good. The Middle Fork Judith has a very stable watershed and is relatively insensitive to roading and logging.
Issues	- What are the present conditions and uses of the area's watershed, and what is its relative sensitivity to development activities?
Alternative 1	The watershed would remain undeveloped. Water quality would remain high. A full range of restoration practices could be used after a natural disaster.
Alternative 2	The watershed would remain essentially undeveloped. Water quality would remain high. The exclusion of motorized vehicle would, over time, return the watershed to a pristine condition. Wilderness classification would limit the kinds and extent of watershed restoration practices that would be used after a natural disaster, such as a flood or forest fire.
Alternative 3	The watershed would remain undeveloped. Water quality would remain high. A full range of restoration practices could be used after a natural disaster.
Alternative 4-5 6 - Preferred	All or part of the watershed would be developed. The stable watershed and relative insensitivity to roading and logging make the Judith suitable for development. The quality of water produced would provide for continued use for irrigation, livestock, and household use. A full range of restoration practices could be used after a natural disaster.

MINERALS	Approximately 150 prospects and mines are within the study area. Sapphire mining near Yogo Creek has been sporadically active depending on market prices. Mineral development opportunities still exist in the Grendah Mountain, Yogo Peak, and at the head of the Lost Fork. Evidence indicates that lead, silver, and molybdenum still exist in quantity, but at long distances from milling sites. Building stone operations are also possible in the vicinity of Yogo Peak. Little or no oil and gas potential exists within the study area.
Issues	- What is hardrock, oil, and gas potential of the area and how should they be managed for that potential?
Alternative 1	Mineral development is governed by mining and mineral leasing laws. No additional roads would be built for management of surface resources under this alternative.
Alternative 2	Until December 31, 1983, the United States mining laws and all laws pertaining to mineral leasing apply to National Forest wilderness to the same extent as they applied to the area prior to its classification. Effective January 1, 1984, subject to existing rights, the minerals in land designated as wilderness are withdrawn from all forms of appropriation under the mining laws pertaining to mineral leasing.
Alternative 3 - 4 - 5 - 6 - Preferred	Mineral development is governed by mining and mineral leasing laws. Roading would increase the opportunities to explore and develop mineral resources. The most roads would be constructed under Alternative 2; the least under Alternative 5.

LANDS	The Middle Fork contains 1,154 acres of contiguous private in-holdings in multiple ownership. Smaller peripheral mineral claims on the west and north contain another 100 acres.
Issues	- What is the present landownership pattern, current access, and use? What is the opportunity for acquisition or to manage potential wilderness in-holdings?
Alternative 1-3-4-5 6 - Preferred	There would be no need to acquire any private in-holdings.
Alternative 2	Acquisition of private in-holdings in the Middle Fork of the Judith is desirable for willing sellers to protect and perpetuate the natural integrity of the area. Scenic easements may also be used to protect these values. Other private lands could be excluded by slight boundary modifications.

FACILITIES - ROADS AND TRAILS

Access is possible via ridge roads to mineral claims and by primitive roads over Studhorse Hill and in and out of stream channels to private in-holdings. The study area contains 52 miles of primitive roads, 12 miles of low standard roads, and 75 miles of trails.

One transmission corridor passes through the southwestern corner of the study area. No known plans exist for other corridors.

Issues

- What type, condition, and amount of road and trail access do the areas contain and what is the potential for roaded form of access?

- What is the present use, location, and opportunities for cutting household firewood and what other energy needs, such as powerline corridors, should be considered?

Comparison

Figures M2.14 and M2.15 show the miles of arterial and collector roads and local roads for five decades by alternative.

FIGURE M2.14

ARTERIAL AND COLLECTOR ROADS

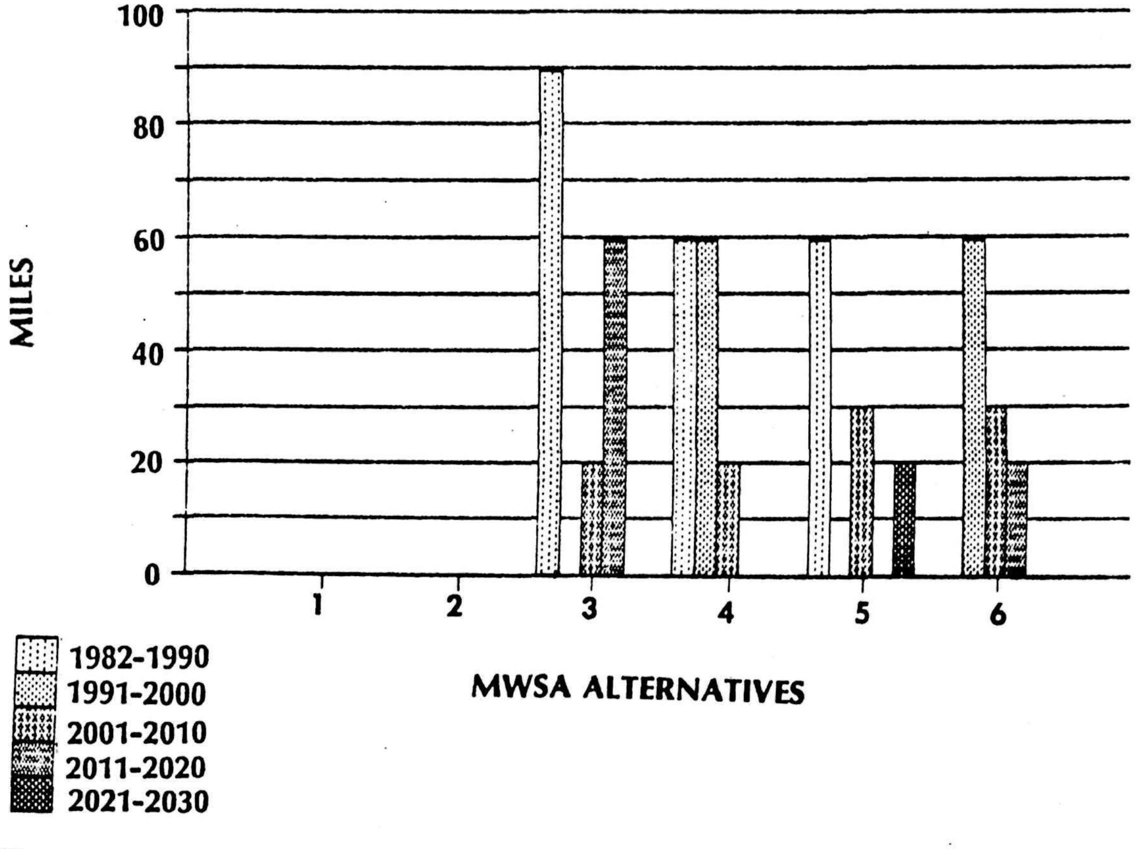
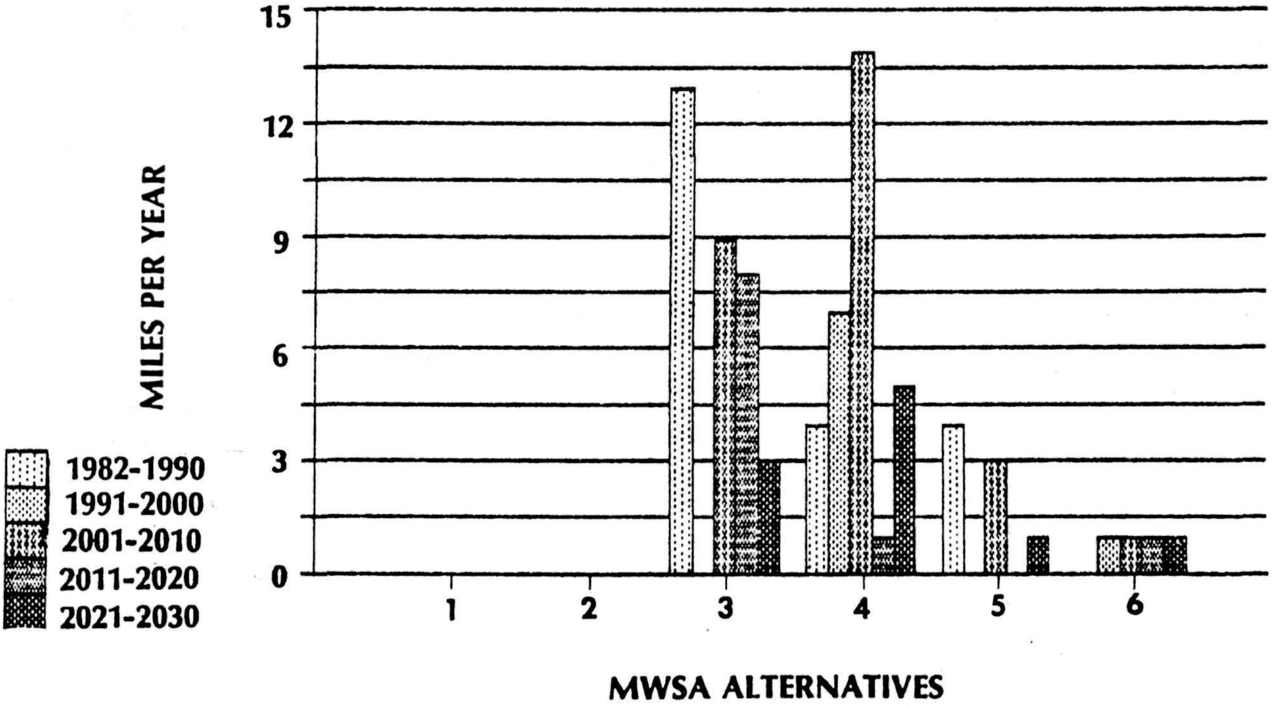


FIGURE M2.15
LOCAL ROADS



Alternative 1	The existing 64 miles of roads would not be maintained. The 75 miles of trails would be retained.
Alternative 2	The 64 miles of existing roads would be closed and rehabilitated. All 75 miles of trail would be retained for wilderness use and management.
Alternative 3	Under this alternative, 17 miles of arterial and collector roads and 330 miles of local road would be constructed. These roads would require 5.6 miles of rights-of-way. Approximately 40 miles of trail would be retained.
Alternative 4	Under this alternative, 14 miles of arterial and collector roads and 310 miles of local roads would be constructed. These would require 5.6 miles of rights-of-way across private land. Approximately 40 miles of trail would be retained.
Alternative 5	Under this alternative, 11 miles of arterial and collector roads and would be constructed. These roads would require 5.6 miles of rights-of-way. Approximately 54 miles of trail would be retained.
Alternative 6 - Preferred	Under this alternative, 11 miles of arterial and collector roads and 40 miles of local roads would be constructed. Approximately 62 miles of trail would be retained. Trail or road right-of-way across 5.6 miles of private land would be required.

PROTECTION - FIRE	All fires are suppressed as quickly as possible. Because most of the study area is composed of old growth stands, the occurrence of natural fuel is high. Fuel accumulations range from low to heavy. Given extreme fire conditions, a fire ignited in heavy fuels would probably burn an entire drainage.
Issues	- What is the present condition and the potential for serious fire. What are the current protection measures and what measures are needed?
Alternative 1	A Fire Management Plan, which uses both planned and unplanned fires to obtain recreation and wildlife objectives, would be developed.
Alternative 2	A Fire Management Plan, which may allow fires started by natural causes to burn within prescription, would be developed. Fire resulting from person-cause activities would be prevented and/or controlled at all times.
Alternative 3 - 4 - 5	All unplanned fires would be suppressed. Prescribed fire would be used to reduce timber harvest slash and improve wildlife and range habitat.
Alternative 6 - Preferred	All unplanned fire in the upper Middle Fork would be suppressed. Prescribed fire would be used to reduce timber harvest slash and improve wildlife and range habitat. A Fire Management Plan, which uses prescribed fires to obtain recreation, range, and wildlife objectives, would be developed for the rest of the area.

PROTECTION - INSECT AND DISEASE

Mountain pine beetle and western spruce budworm pose the greatest threat in the study area. Old growth lodgepole pine stands are the most susceptible to mountain pine beetle. This beetle reached epidemic levels in 1964 and has persisted since then. Although Douglas fir beetle and spruce budworm have not been a problem in recent years, the potential does exist for an outbreak to occur in both Douglas fir and Englemann spruce. Spruce budworm is presently not a problem. However, this area was heavily infested in the early 1950's and 1960's. Destructive populations could rebuild. Should an insect epidemic occur, mortality would cause compound fire conditions and potential.

Issues

- What is the present condition and the potential for serious insect and disease infestation? What are the current protection measures, and what measures are needed?

Alternative 1

Insect and plant disease outbreaks would not be artificially controlled unless necessary to protect timber or other valuable vegetation outside the area.

Alternative 2

In classified wilderness, insect and plant disease outbreaks are not artificially controlled unless necessary to protect timber or other valuable vegetation outside wilderness.

Alternative 3 - 4 - 5
Alternative 6 - Preferred

Vegetation management would be directed to reduce losses from insect and plant disease on those lands that were developed. On lands that remain in a semi-primitive recreation setting, insect and plant disease outbreaks would not be artificially controlled unless necessary to protect timber or valuable vegetation outside the area.

QUANTITATIVE ECONOMIC COMPARISON

Issues

- What resources do the areas contain and how should the study area's resource outputs be allocated toward meeting the RPA program goals?

- What considerations should be given to maintaining current employment levels for dependent communities?

The Middle Fork Judith Wilderness Study Area is located in Judith Basin County. Like most of the area-of-influence, Judith Basin County is heavily dependent on farming and ranching. It has a stable population, which is projected to have a slight decline over the next 20 years. The study area is close to local wood processing plants, especially White Sulphur Springs, which is about 30 miles to the southeast.

National needs for goods and services are reflected in the objectives assigned to the Lewis and Clark National Forest by the RPA (Resource Planning Act) Program (see Table 2.2 in the Forest Plan EIS). Table M2.2 displays some of the contributions the Middle Fork Judith makes to the RPA Program.

Benefits

Benefit values were assigned to market outputs and selected nonmarket outputs. Dollar values were assigned to benefits from timber, range, recreation, and oil and gas leasing. These values are discussed under costs and benefits in the Alternative Formulation portion of this chapter.

Return to U.S. Government

This is the revenue the Forest collects from timber sales, grazing fees, timber purchasers road credits, sale area betterment collections, recreation fees, mineral leasing, and land use charges which are returned to the U.S. Treasury.

Return to State

By Federal law, 25 percent of this revenue is returned to the State for use by the counties for schools and roads. Counties' shares of the payment are determined by the acreage of National Forest within the county. In addition, counties receive PILT (payment in-lieu of taxes). PILT ranges from 10 cents to 75 cents per acre.

Costs

Forest Service costs are estimated for each alternative.

Table M2.3 displays the benefits and costs of the alternatives.

TABLE M2.3
MIDDLE FORK JUDITH
ANNUAL BENEFITS AND COSTS

(Thousand Dollars)
(Values Given In 1978 Dollars)

DECADE	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	(Preferred) ALT 6
1982-1990						
Total Benefits	269.0	282.6	3470.6	1447.3	1969.6	269.1
Returns To US Govt.	6.6	1.6	218.6	84.6	76.6	6.6
Total Costs	72.3	62.4	286.4	166.0	1416.4	72.4
Total Net Benefits	196.7	220.2	3184.2	1281.3	553.2	196.6
1991-2000						
Total Benefits	289.9	305.6	248.6	2083.9	272.8	892.4
Returns To US Govt.	6.6	1.6	6.6	126.6	6.6	28.6
Total Costs	72.3	62.4	71.9	213.2	53.6	562.3
Total Net Benefits	217.6	243.2	176.7	1870.7	219.2	330.1
2001-2010						
Total Benefits	311.1	326.7	2614.2	3916.6	2151.1	1177.6
Returns to US Govt.	6.6	1.6	162.7	248.7	52.7	28.7
Total Costs	72.3	62.4	235.9	317.5	1232.0	692.9
Total Net Benefits	238.7	264.3	2378.3	3599.1	919.1	484.7
2011-2020						
Total Benefits	332.0	348.8	2434.4	408.9	311.2	796.7
Returns to US Govt.	6.6	1.6	150.7	16.7	6.7	16.7
Total Costs	72.3	62.4	236.9	81.9	66.4	416.9
Total Net Benefits	259.7	286.4	2197.5	327.0	244.8	379.8
2021-2030						
Total Benefits	352.9	371.8	1094.4	1636.8	662.6	827.9
Returns to US Govt.	6.6	1.6	60.8	96.8	12.7	16.7
Total Costs	72.3	62.4	124.1	158.4	242.7	319.5
Total Net Benefits	280.6	309.0	970.3	1478.4	419.9	508.4
PNV @ 4%	4858.8	5406.4	43302.8	37778.9	10550.7	7099.8

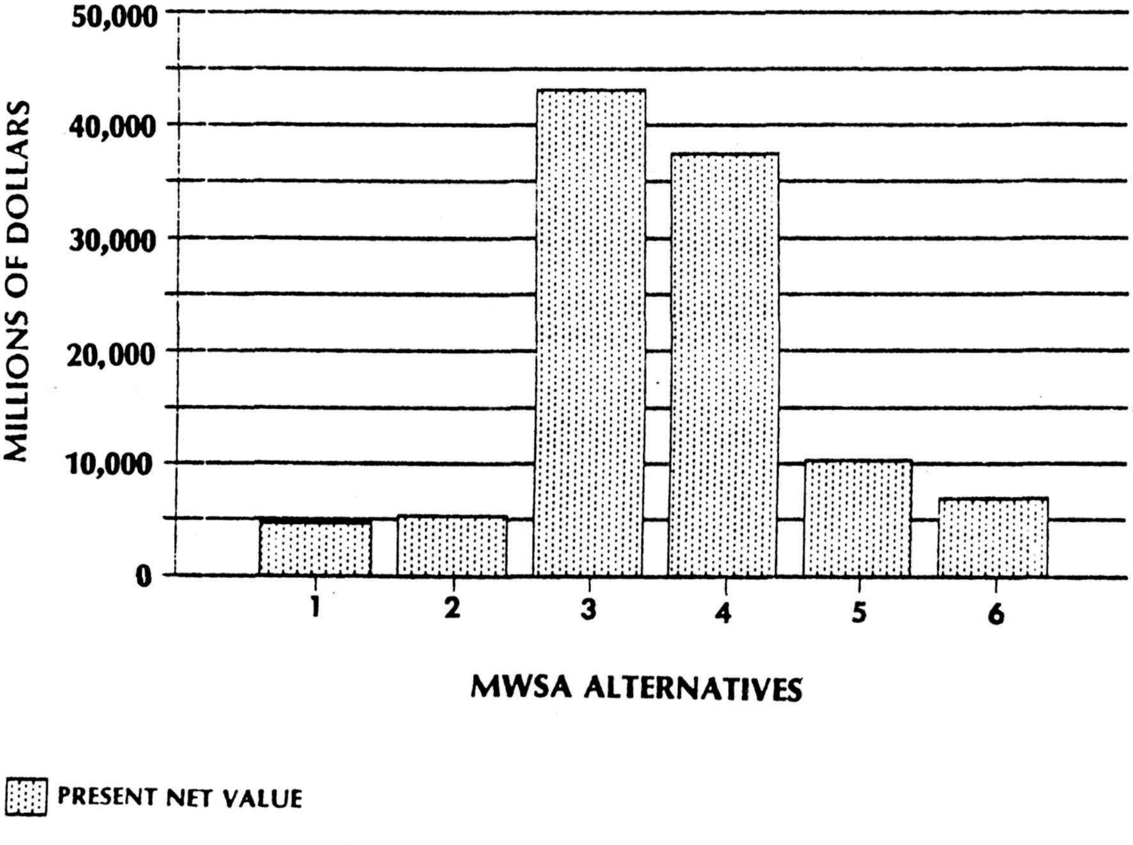
PRESENT NET VALUE

PNV (present net value) is a economic evaluation tool useful in examining the economic differences between alternatives. PNV is the discounted benefit less discounted costs associated with providing all resource outputs associated with providing all resource outputs to which monetary value can be assigned, including both market and selected non-market outputs. PNV was calculated over a 50 year planning horizon because cost and benefit data for the MWSA areas were not available beyond the first 50 years. The costs and benefits used in this calculation are mentioned in the Alternative Formulation portion of this chapter. Figure M2.16 displays PNV for each alternative.

The allocation and scheduling of acres in management prescriptions for each alternative was done by maximizing PNV in FORPLAN. This satisfied NFMA regulations which require each alternative represent the "most efficient combination of management practices examined that can meet the objectives established in the alternatives."

FIGURE M2.16

PRESENT NET VALUE



Alternative 1

Alternative 1 has a low PNV due to no revenues received from timber harvesting and also recreation being valued as dispersed recreation at $3.00/RVD. The only commodity which generates revenue is range. Big game hunting days, at a value of $21.00/day, contribute to a significant part of the benefits.

Alternative 2

Alternative 2 ranks higher than Alternative 1 because of wilderness classification. This classification assigns a high value to primitive (wilderness) recreation ($8.00/RVD). Therefore, benefits from recreation are much greater than those from Alternative 1. All other outputs are the same as Alternative 1.

Alternative 3 - 4 - 5
6 - Preferred

Under these alternatives, PNV is higher because of timber harvesting.* The decrease in big game hunting benefits are offset by high timber revenues. These alternatives have a higher PNV than Alternatives 1 and 2, with Alternative 3 having the highest PNV.

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*When the analysis for this EIS was started the most recent data indicated the average price for timber was $42 per thousand board feet. Recently, the average price has been $27 per thousand board feet. An economic analysis using the most recent price would result in a lower PNV for alternatives which schedule timber harvest.

EMPLOYMENT AND INCOME

Tables M2.4 and M2.5 display employment and income changes. These changes are based on increases in timber harvest and grazing levels. Projections were made based on an input/output model used for Forest Plan alternatives. The input/output model is described in the planning record, "Input/Output Model". The magnitude and effects of these changes are discussed in Chapter IV.

TABLE M2.4 CHANGE IN EMPLOYMENT BY ALTERNATIVE (PEOPLE)

TIME PERIOD	1	2	3	4	5	6
1982-1990	0	0	140	50	45	0
1991-2000	0	0	0	80	0	15
2001-2010	0	0	100	160	30	15
2011-2020	0	0	95	5	0	5
2021-2030	0	0	35	60	5	5

TABLE M2.5 CHANGE IN INCOME BY ALTERNATIVE (THOUSANDS OF DOLLARS)

TIME PERIOD	1	2	3	4	5	6
1982-1990	0	0	1990	730	660	0
1991-2000	0	0	0	1130	0	210
2001-2010	0	0	1460	2270	430	210
2011-2020	0	0	1350	90	0	90
2021-2030	0	0	510	840	60	90

COMPARISON OF QUALITATIVE NET PUBLIC BENEFITS

Introduction

The interdisciplinary team evaluated the alternatives to determine which alternative maximized net public benefit. Net public benefit is important since it represents the overall value to the nation of all benefits less all costs, regardless of whether the costs and benefits are expressed in quantitative (PNV) or qualitative terms (often subjectively measured). The PNV component of each alternative's net public benefit is displayed in Table M2.3.

Each alternative is compared as to how well it addresses the qualitative components of net public benefit. The qualitative components of net public benefit include:

1) Elk Hunting Quality - The quality of big elk hunting varies by alternative. Currently elk hunting quality indicators include the length of the hunting season and the population structure of the animals harvested. Both quality indicators are influenced by the currently unroaded situation on the study area. Timber harvesting on elk hiding cover areas would have varying impacts on elk hunting quality. Each alternative was examined to determine its impact on elk hunting quality and whether or not the PNV trade-offs are acceptable.

2) Semi-Primitive Recreation Setting - According to public involvement comments the maintenance of a semi-primitive recreation setting in certain parts of the Forest is important to large segments of the public. The Middle Fork Judith is highly valued for its semi-primitive recreation opportunity. Each alternative was examined in light of its impacts on these areas.

3) Visual Quality - Visual quality constraints have been included in the FORPLAN runs and therefore reduce the PNV. Whether the benefits produced exceed the costs involves a subjective component that needs to be considered in the qualitative net public benefit analysis.

4) Lifestyles and Business Stability - The opportunities for local people, ranchers, and small business to make use of the posts, poles, and/or firewood are not valued in the PNV. The maintenance of existing lifestyles of ranches and businesses depend on such Forest products. These opportunities vary by alternative.

MIDDLE FORK JUDITH

Qualitative

Alternative 1

Alternative 1 would increase the quality of elk hunting the most of any alternative. Timber is not harvested on a regulated basis. Grazing would not increase. These factors contribute to an increase in the overall elk population potential. The population structure should be maintained or improved.

The Middle Fork Judith would maintain its semi-primitive recreation setting. Both motorized and non-motorized recreation would be permitted.

Visual quality would not be affected.

The opportunity to make use of posts, poles, and/or firewood would not increase.

Alternative 2

Alternative 2 would maintain the quality of elk hunting. No timber would be harvested. Grazing would not increase.

The Middle Fork Judith would be managed as wilderness (primitive recreation setting). Motorized recration would not be permitted.

Visual quality would not be affected.

The opportunity to make use of post, poles, and/or firewood would be foregone.

Alternative 3-4

Alternatives 3 and 4 would drastically lower the quality of elk hunting. Because most of the lands are accessed for timber, hiding cover would be reduced. With less hiding cover, animals would be harvested quickly and fewer mature animals would be available.

Alternative 3 would not retain any of the area in a semi-primitive recreation setting. Alternative 4 would retain 8,000 acres in a semi-primitive recreation setting.

Alternatives 3 and 4 affect visual quality the most. They contain the most acres in the modification class.

The opportunity to make use of posts, poles, and/or firewood would increase.

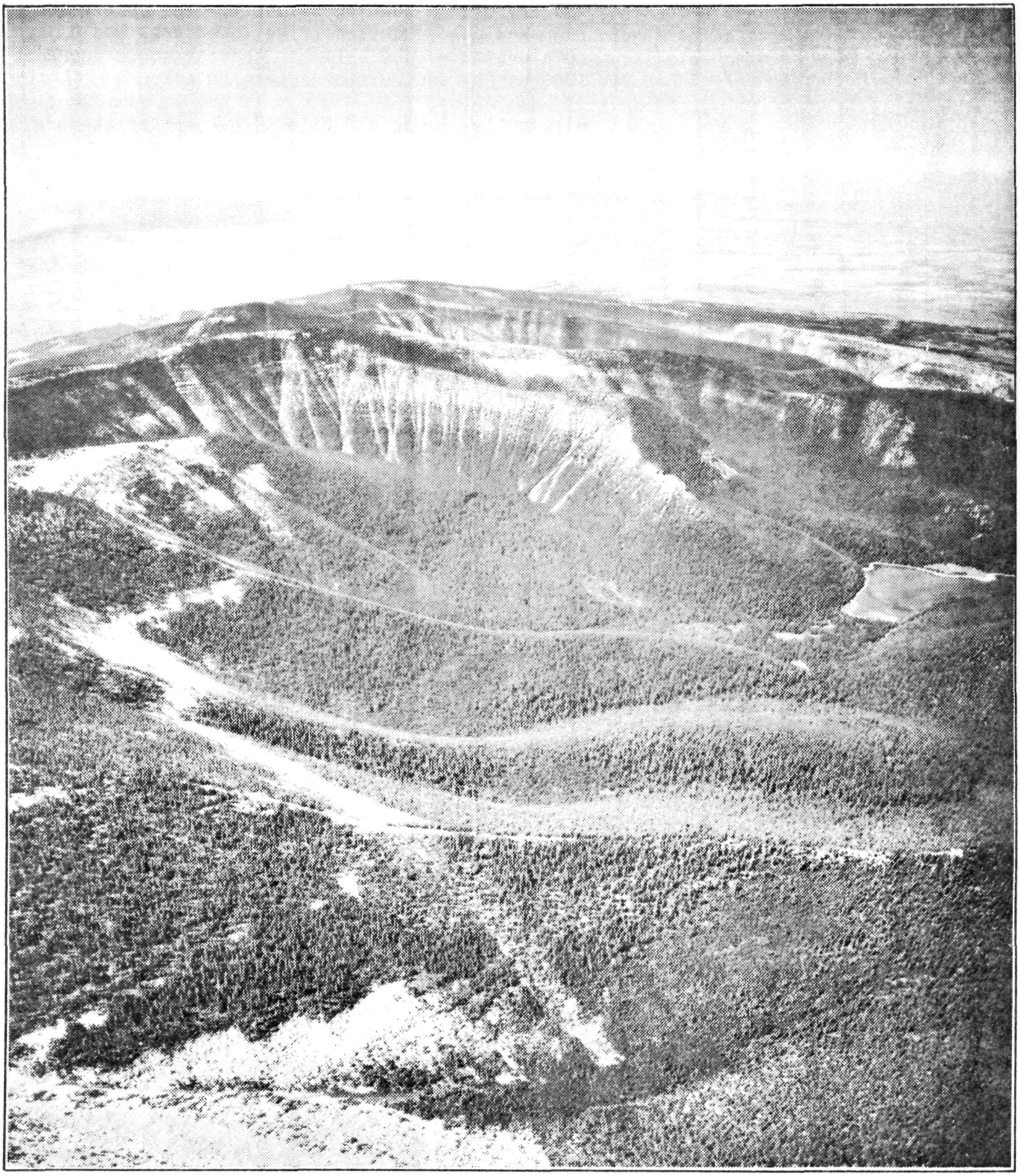
Alternative 5
6 - Preferred

Alternatives 5 and 6 (Preferred) would lower the quality of elk hunting slightly. The upper Middle Fork would be accessed. The lower area would remain undeveloped. Timber harvest would cause some easier and quicker access to elk.

Alternative 5 would retain 60 percent of the area in a semi-primitive recreation setting. Alternative 6 (Preferred) would retain 75 percent of the area in a semi-primitive recreation setting.

Alternative 5 would affect the visual quality on 38,000 acres. Alternative 6 would affect 24,000 acres.

The opportunity to make use of posts, poles, and/or firewood would increase slightly.



MONTANA WILDERNESS STUDY AREA IN THE BIG SNOWY MOUNTAINS.

ALTERNATIVES CONSIDERED IN DETAIL

The following alternatives for the Big Snowies Wilderness Study Area were considered in detail:

Alternative 1 - Preferred Alternative, Forest Plan Alternatives C, D, & F

The Big Snowies Wilderness Study Area would be managed for semi-primitive recreation and wildlife habitat (see Figure M2.17). This is the same as Forest Plan Alternative Current Plan except for a slight increase in grazing.

Alternative 2 - Forest Plan Alternatives A-1, B-1, & E-1.

The Big Snowies Wilderness Study Area would be recommended for wilderness classification (see Figure M2.18).

Alternative 3 - Forest Plan Alternative A-2

The Big Snowies Wilderness Study Area would be managed to provide a high level of commodity products (see Figure M2.19).

Alternative 4 - Forest Plan Alternative E-2

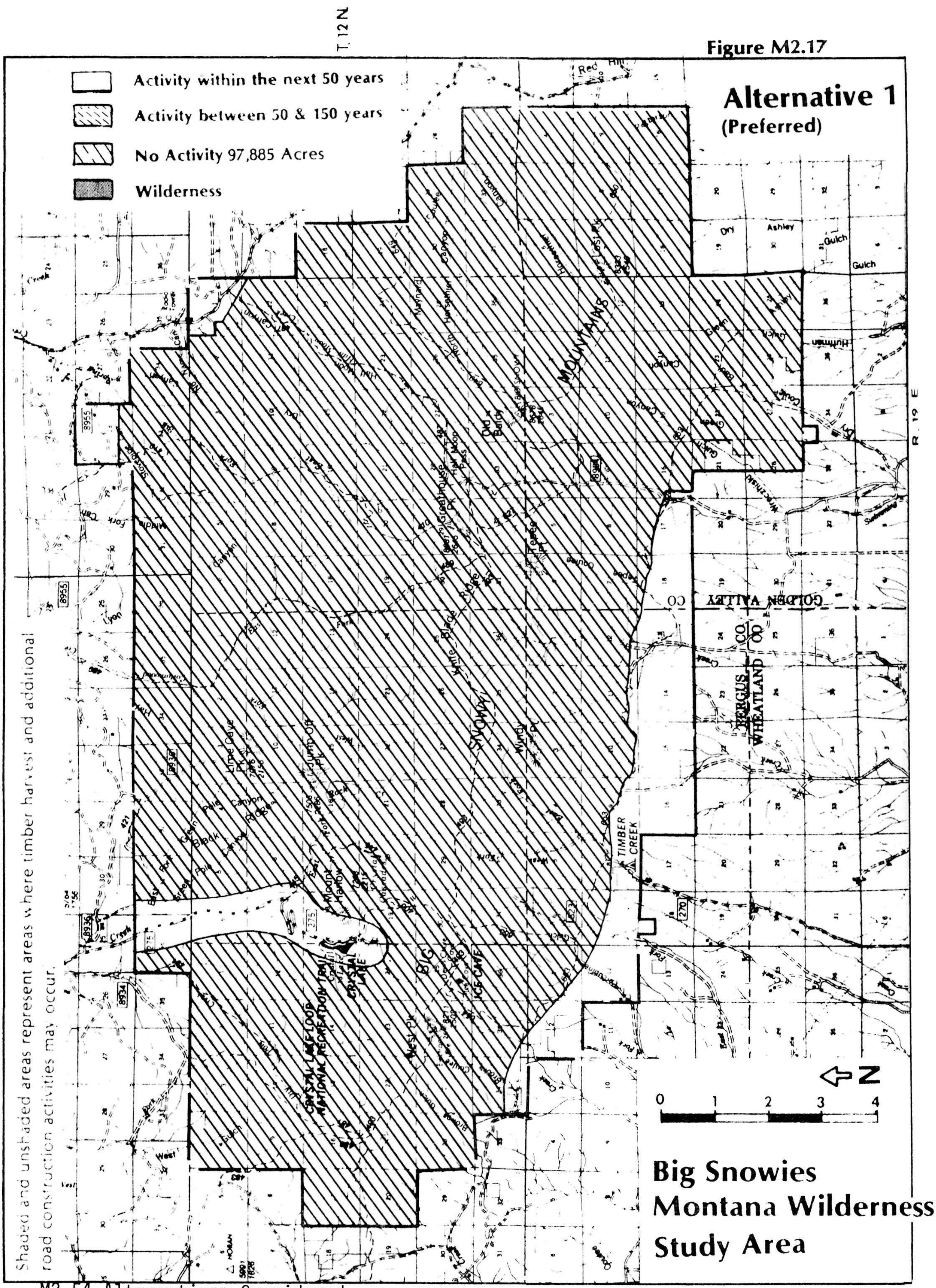
The Big Snowies Wilderness Study Area would be managed to provide a moderate level of commodity products (see Figure M2.20).

Alternative 5 - Forest Plan Alternative B-2

The Big Snowies Wilderness Study Area would be managed to provide a low level of commodity products (see Figure M2.21).

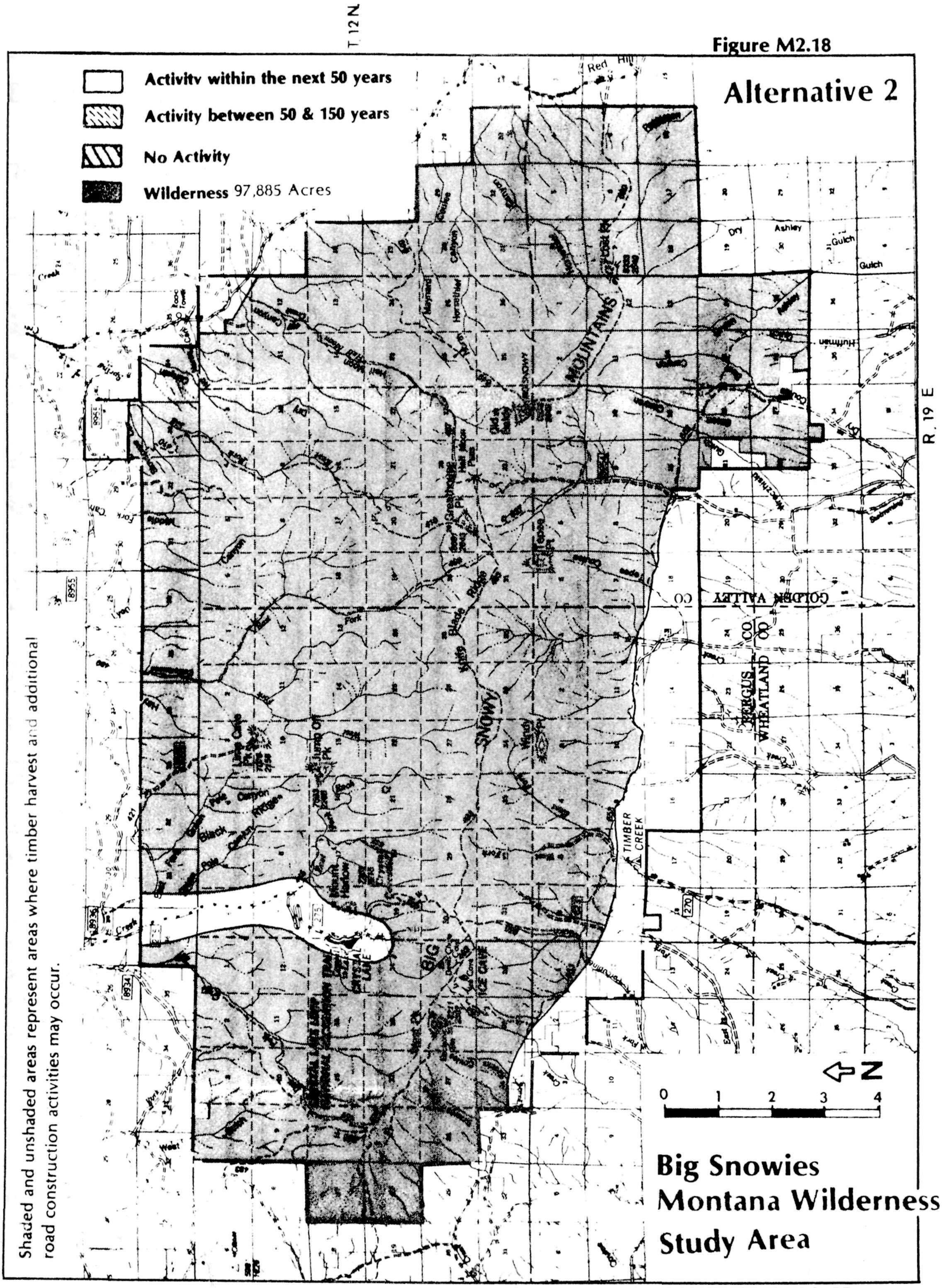
The allocation of land management emphasis by alternative is shown in Table M2.6. A summary of resource outputs for the alternatives is shown in Table M2.7.

Figure M2.17


T.12N
Activity within the next 50 years
Activity between 50 & 150 years
No Activity 97,885 Acres
Wilderness
Alternative 1
(Preferred)
Big Snowies
Montana Wilderness
Study Area
R.19E
0 1 2 3 4
N
BIG SNOWY MOUNTAINS
CRYSTAL LAKE
CRYSTAL LAKE LOOP NATIONAL RECREATION TRAIL
ICE CAVE
TIMBER CREEK
GOLDEN VALLEY CO
FERGUS CO
WHEATLAND CO
Old Baldy
Greathouse Pk
Half Moon Pass
Jump Off Pk
Blake Ridge
Red Hill
Ashley
Dry
Gulch
Huffman
Swimming Woman
Neil Creek
Lime Cave
East Fork
Grove Creek
Big Pk
Fork
Canyon
Black Pole
Pole Canyon
West Pk
Mount Harlow
Windy Pk
8955
8936
8934
8984
275
270
421
427
457
483

Shaded and unshaded areas represent areas where timber harvest and additional road construction activities may occur.

Figure M2.18

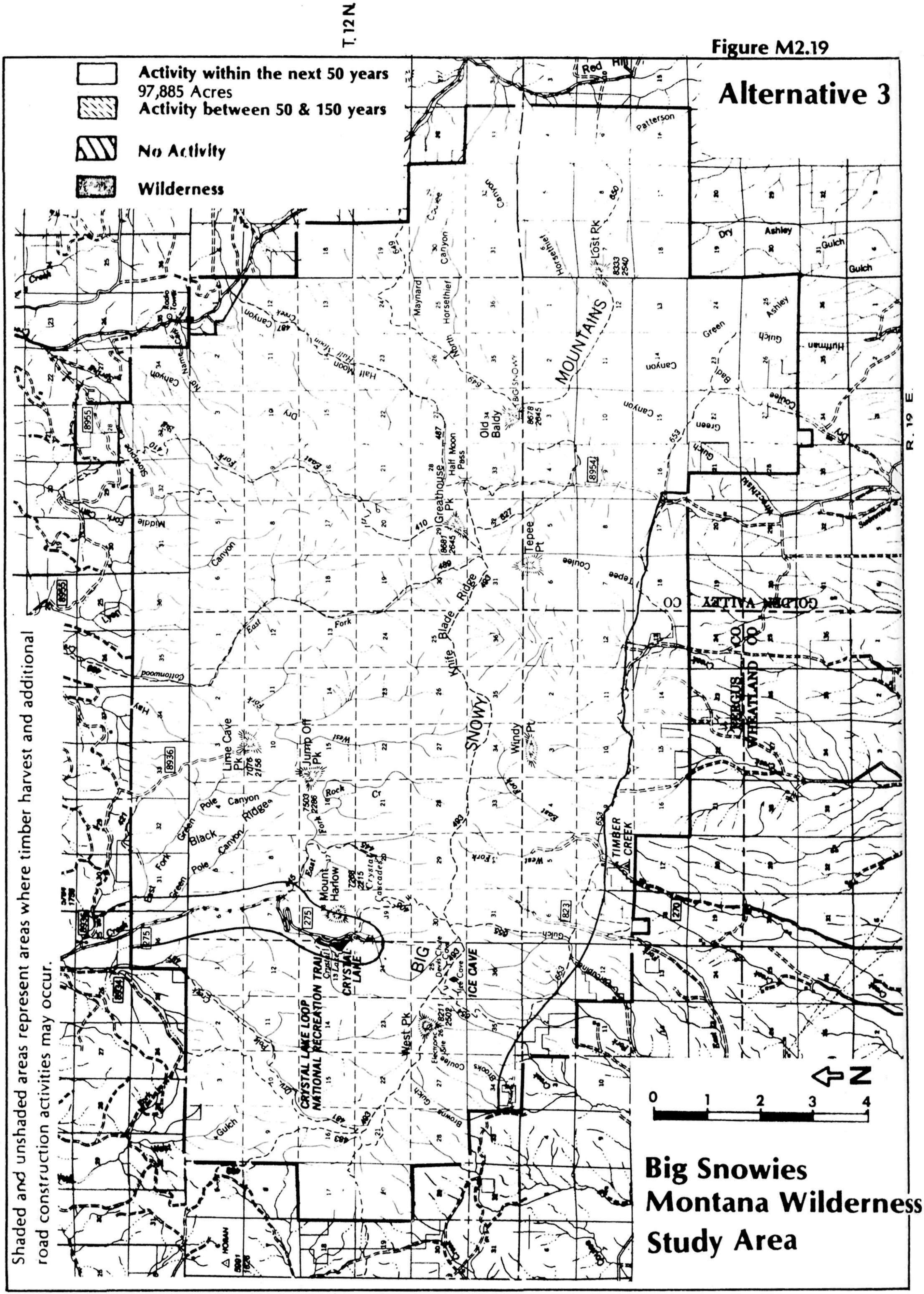

T 12N
R. 19 E
Activity within the next 50 years
Activity between 50 & 150 years
No Activity
Wilderness 97,885 Acres
Red Hill
Dry
Ashley
Gulch
Gulch
Huffman
MOUNTAINS
SNOWY
BIG
Greathouse Pk
Jump Off Pk
Blade Ridge
Black Pole Canyon Ridge
CRYSTAL LAKE
ICE CAVE
GOLDEN VALLEY CO
FERGUS CO
WHEATLAND CO
TIMBER CREEK
Creek
Fork
West
8934
8936
8995
270
275
Z
0
1
2
3
4

Alternative 2

Shaded and unshaded areas represent areas where timber harvest and additional road construction activities may occur.

Big Snowies Montana Wilderness Study Area

Figure M2.19

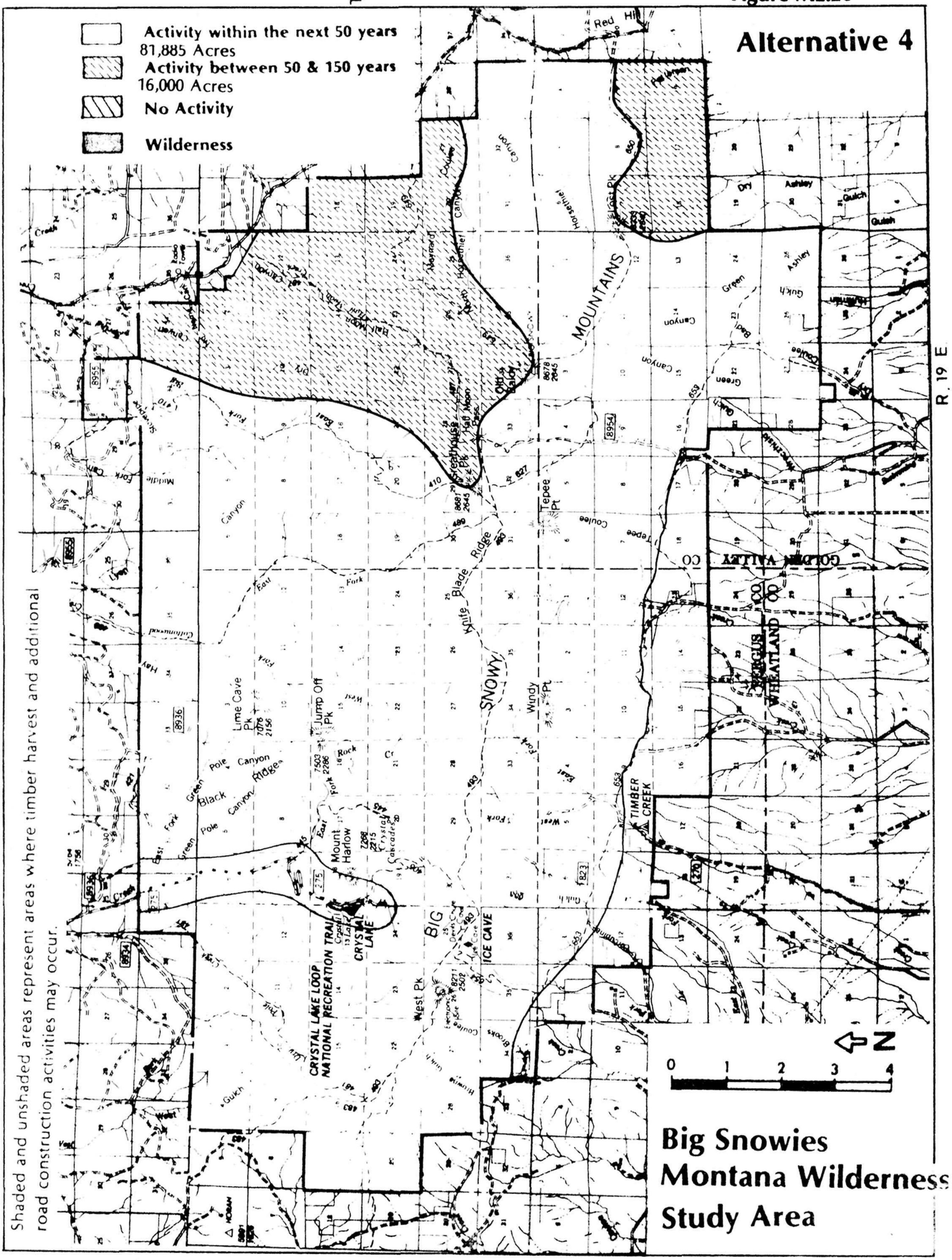

T. 12 N.
R. 19 E.
Activity within the next 50 years
97,885 Acres
Activity between 50 & 150 years
No Activity
Wilderness
BIG SNOWY MOUNTAINS
Old Baldy
Greathouse Pk
Half Moon Pass
Tepee Pt
Lost Pk
Knife Blade Ridge
Windy Pt
Lime Cave Pk
Jump Off Pk
Mount Harlow
Crystal Lake
CRYSTAL LAKE LOOP NATIONAL RECREATION TRAIL
ICE CAVE
West Pk
TIMBER CREEK
GOLDEN VALLEY CO
FERGUS CO
WHEATLAND CO
Red Hill
Patterson
N
0
1
2
3
4

Alternative 3

Big Snowies Montana Wilderness Study Area

Shaded and unshaded areas represent areas where timber harvest and additional road construction activities may occur.

Figure M2.20



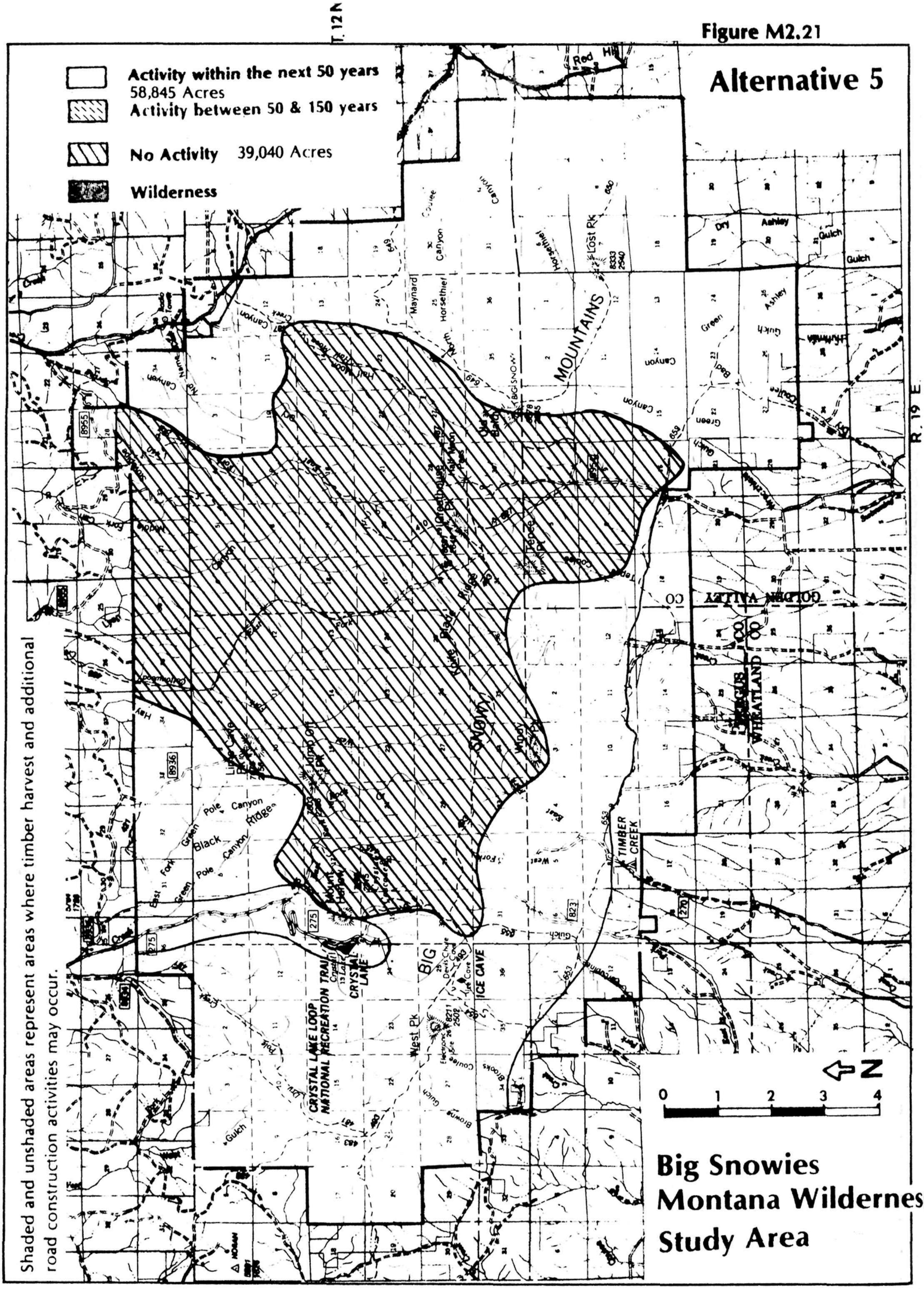
Alternative 4

Big Snowies Montana Wilderness Study Area

Shaded and unshaded areas represent areas where timber harvest and additional road construction activities may occur.

T. 12 N
R. 19 E
Activity within the next 50 years
81,885 Acres
Activity between 50 & 150 years
16,000 Acres
No Activity
Wilderness
Red Hill
MOUNTAINS
SNOWY
BIG
Knife Blade Ridge
Half Moon Pass
Old Baldy
Greathouse Pk
Tepee Pt
Windy Pt
Lime Cave Pk
Jump Off Pk
Mount Harlow
Crystal Cascades
CRYSTAL LAKE
CRYSTAL LAKE LOOP NATIONAL RECREATION TRAIL
ICE CAVE
West Pk
Black Pole Canyon Ridge
Green Pole Canyon
Tepee Coulee
Horseshoe Canyon
Dry Gulch
Ashley Gulch
Green Canyon
Maynard Coulee
TIMBER CREEK
GOLDEN VALLEY CO
FERGUS CO
WHEATLAND CO
HOBAN
8678 2645
8681 2645
7503 2286
7076 2156
7268 2215
8221 2502
8955
8954
8936
8934
823
0 1 2 3 4
N

Figure M2.21



Alternative 5

☐ Activity within the next 50 years 58,845 Acres
▨ Activity between 50 & 150 years
▨ No Activity 39,040 Acres
■ Wilderness
T. 12 N
R. 19 E
BIG SNOWY MOUNTAINS
GOLDEN VALLEY CO
WHEATLAND CO
CRYSTAL LAKE LOOP NATIONAL RECREATION TRAIL
CRYSTAL LAKE
ICE CAVE
TIMBER CREEK
West Pk
Lost Pk
Red Hill
N
0 1 2 3 4

Shaded and unshaded areas represent areas where timber harvest and additional road construction activities may occur.

Big Snowies Montana Wilderness Study Area

TABLE M2.6

ALLOCATION OF ACRES TO MANAGEMENT EMPHASIS BY ALTERNATIVE BIG SNOWIES

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Mininum Level Management	85289	0	27369	30715	47540
Range Management	9603	0	13220	16131	22182
Timber Management	0	0	28119	44375	23161
Timber/Range Management	0	0	3947	3115	777
Timber/Wildlife/ Visual Management	0	0	14880	648	1499
Wildlife Management	2812	0	5223	2901	2726
Wildlife/Range Management	181	0	5126	0	0
Wilderness Management	0	97885	0	0	0

1/ A description of the FORPLAN prescriptions grouped into these management emphases is given in Appendix C.

TABLE M2.7
BIG SNOWIES

SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE
Average Annual Output

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT-1 (Preferred)	ALT-2	ALT-3	ALT-4	ALT-5
Recreation Use Potential by 2030 (Base Year 1980 in Parentheses)	Thousand RVDs					
- Primitive (0)		0	11.5	0	0	0
- Semi-Primitive (20.6)		20.6	0	0	3.4	8.2
- Roaded Natural Appearing (0)		0	0	163.1	136.3	97.9
Recreation Setting by 2030 (Base Year 1980 in Parentheses)	Thousand Acres					
- Wilderness (0)		0	97.9	0	0	0
- Semi-Primitive (97.9)		97.9	0	0	16.0	39.1
- Roaded Natural Appearing (0)		0	0	97.9	81.9	58.8
Visual Quality Objectives	Thousand Acres					
- Preservation		0	97.9	0	0	0
- Partial Retention		97.9	0	0	16.0	39.1
- Modification		0	0	97.9	81.9	58.8
Wildlife						
- Habitat Improvement	Acre Equivalents					
-1982-1990		110	0	290	100	100
-2021-2030		110	0	320	100	100
- Elk Population Potential	Number					
-1982-1990		100	100	100	100	100
-2021-2030		100	100	100	100	100
- Elk Hunter Recreation	Hunter Days					
-1982-1990		1000	1000	1000	1000	1000
-2021-2030		1000	1000	800	900	900
Range	AUMs					
- 1982-1990		3000	2700	3000	3000	3000
- 2021-2030		3300	2700	3600	3600	3300
Timber						
- Land Available, Capable, and Suitable	Thousand Acres	0	0	46.1	49.9	44.8
- Programmed Sales Offered	Million Board Feet					
- 1982-1990		0	0	.4	.4	.4
- 1991-2000		0	0	0	0	1.6
- 2001-2010		0	0	.2	.2	.2
- 2011-2020		0	0	3.9	2.1	1.1
- 2021-2030		0	0	5.3	1.9	3.4
- Reforestation (Natural and Planting)	Acres					
- 1982-1990		0	0	40	40	50
- 1991-2000		0	0	0	0	210
- 2001-2010		0	0	20	20	30
- 2011-2020		0	0	480	260	140
- 2021-2030		0	0	660	240	430

TABLE M2.7
BIG SNOWIES

SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE
Average Annual Output

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT-1 (Preferred)	ALT-2	ALT-3	ALT-4	ALT-5
Minerals						
- Lands available for Oil and Gas Occupancy Leasing	Thousand Acres	9.0	0	9.0	9.0	9.0
Roads						
- Arterial and Collector to be constructed	Miles					
- 1982-1990		0	0	.8	.8	.8
- 1991-2000		0	0	0	0	1.5
- 2001-2010		0	0	.5	.5	.5
- 2011-2020		0	0	3.1	3.9	1.0
- 2021-2030		0	0	4.6	3.9	3.1
- Local	Miles					
- 1982-1990		0	0	1	1	1
- 1991-2000		0	0	0	0	2
- 2001-2010		0	0	1	1	1
- 2011-2020		0	0	5	3	2
- 2021-2030		0	0	7	3	4
Prescribed burning	Acres	90	0	220	130	100
Social/Economic						
-Change in Employment						
-1982-1990	Person Years	0	0	5	5	5
-2021-2030		0	0	70	25	45
Returns to U.S. Government [1]	Thousand Dollars					
- 1982-1990		52.4	4.9	60.4	60.4	60.4
- 2021-2030		52.4	4.9	159.5	71.5	120.7
Total Budget required to implement 1/	Thousand Dollars					
- 1982-1990		111.0	83.6	165.4	165.6	165.6
- 2021-2030		123.3	82.0	315.8	240.0	277.7
Present Net Value @ 4%	Thousand Dollars	-677.4	427.7	558.1	151.2	341.0

[1] Values given in 1978 dollars

ALTERNATIVE COMPARISON

This part of the chapter summarizes the comparison of alternatives.

Alternative 1 Preferred

Alternative 1 would maintain the Big Snowies Wilderness Study Area much like it is today. The area would remain undeveloped and timber would not be harvested on a regulated basis. Both motorized and non-motorized semi-primitive recreation opportunities would be provided.

Alternative 2

Alternative 2 would recommend wilderness classification for the Big Snowies Wilderness Study Area. Wilderness designation would result in the area being managed in such a manner as to leave it unimpaired for future generations use and enjoyment. Timber and motorized recreation opportunities would be foregone.

Alternative 3

Alternative 3 would provide the highest levels of timber and range outputs. All of the study area would be developed. Semi-primitive recreation opportunities would be foregone. Wildlife habitat would change and elk hunting opportunity would decrease.

Alternative 4

Alternative 4 also provides high levels of timber and range outputs. About 85 percent of the study area would be developed. Most semi-primitive recreation opportunities would be foregone. Elk hunting opportunity would decrease.

Alternative 5

Alternative 5 would provide moderate levels of timber and range outputs. About 60 percent of the study area would be developed. Many semi-primitive recreation opportunities would be foregone.

RECREATION

Current available dispersed recreation opportunity is 20,600 RVDs of semi-primitive recreation in the Big Snowies Wilderness Study Area. Current use is about 4,000 RVDs semi-primitive, non-motorized recreation and 1,700 RVDs of motorized recreation. The study area contains no special facilities for elderly or handicapped people.

Issues

- What are the amounts and kinds of recreation opportunities the area presently supports or is capable of supporting?
- What is the current type and amount of motorized vehicle use and what is the potential for that use?
- How much need is there for the study area to contribute to recreation opportunities for physically handicapped and elderly persons?
- How important are economic efficiencies and other economic impacts in determining the level and location of resource development in the study areas?

Comparison

Figures M2.22 and M2.23 display the projected recreation opportunity and recreation setting in 2030 by alternative.

FIGURE M2.22
PROJECTED DISPERSED RECREATION OPPORTUNITY

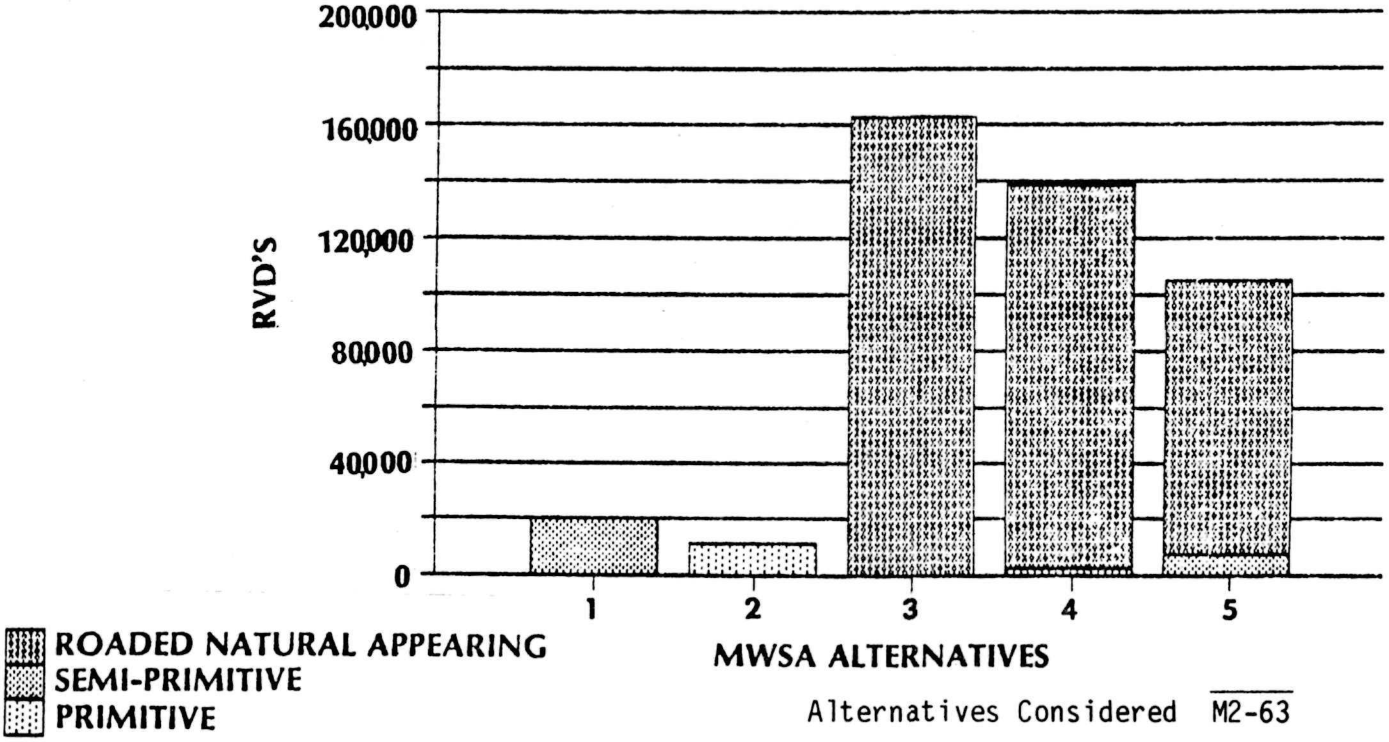
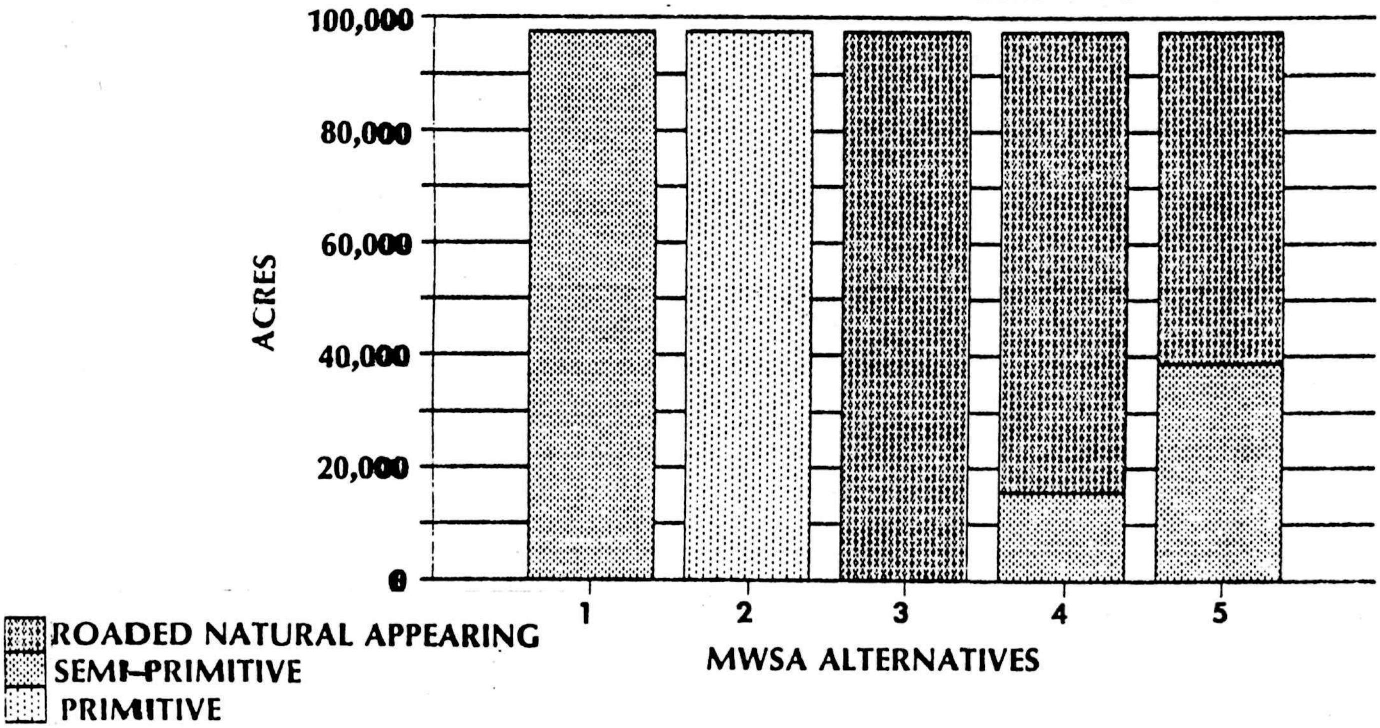


FIGURE M2.23

PROJECTED DISPERSED RECREATION SETTING



Alternative 1	The Big Snowies Wilderness Study Area would provide about 20,600 RVDs of semi-primitive motorized and non-motorized recreation.
Alternative 2	The area would provide 11,500 RVDs of primitive recreation (wilderness) opportunity. Under wilderness classification the area would be closed to motorized vehicles.
Alternative 3 - 4 - 5	As areas would be roaded, the recreation setting would change to a roaded natural appearing and use levels would increase. Alternative 3 would provide 163,100 RVDs of roaded natural appearing recreation opportunity. Alternative 4 would provide 136,300 RVDs of roaded natural appearing recreation and 3,400 RVDs of semi-primitive recreation. Alternative 5 would provide 97,900 RVDs of roaded natural appearing recreation and 8,200 RVDs of semi-primitive recreation.

VISUAL RESOURCES

The Big Snowies Wilderness Study Area is essentially a natural environment. The alpine and tundra vegetation on the crest and canyon wall, along with unique rock formations and cliffs, are scenic attractions. Unobstructed views of surrounding plains, agriculture lands, and distant mountain ranges present opportunities for pleasure viewing and photography. On clear days it is possible to see mountain ranges up to 100 miles away.

Issues

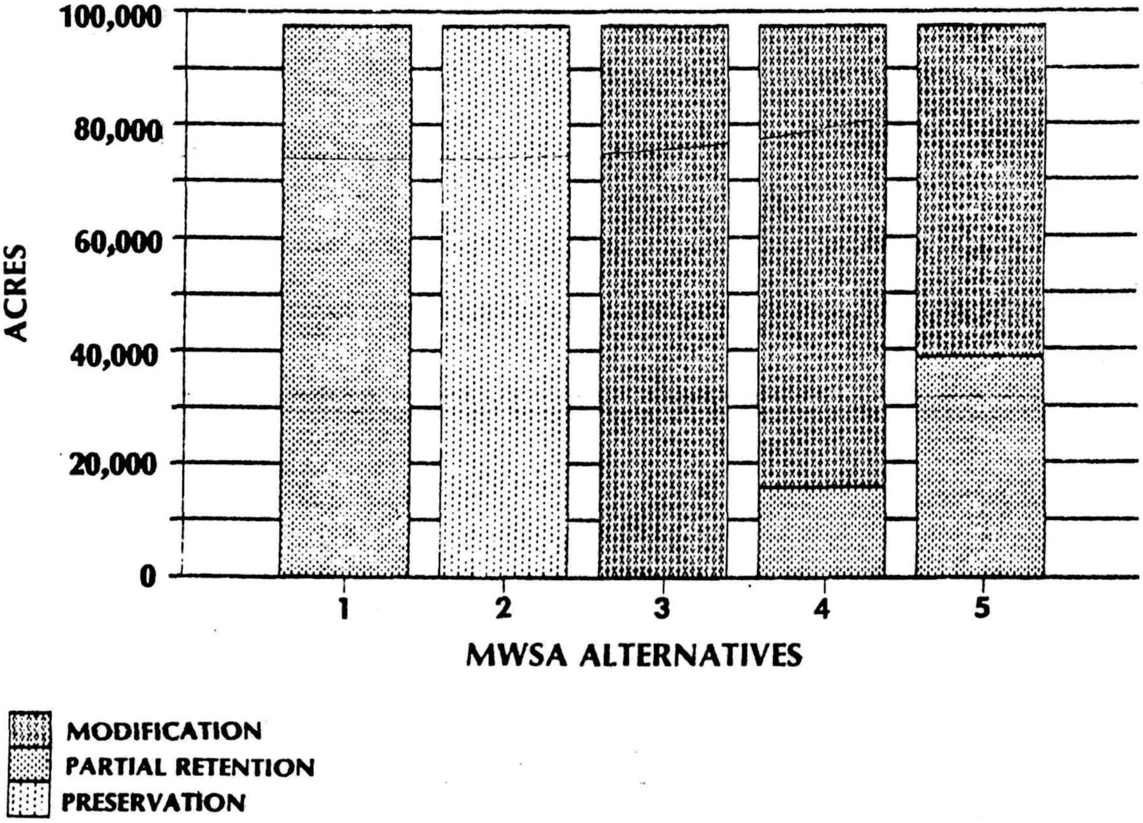
- What esthetic value does the area contain and how should these values be protected?

Comparison

Figure M2.24 shows the acres in each of the visual management objectives: preservation, partial retention, and modification.

FIGURE M2.24

VISUAL QUALITY OBJECTIVES



BIG SNOWIES

Alternative Comparison

Alternative 1 **Preferred**	The Big Snowies Study Area would be managed to maintain the natural landscape of the area.
Alternative 2	Recommended wilderness classification would preserve the natural landscape of the study area.
Alternative 3	The landscape on all 97,885 acres would be modified.
Alternative 4	The natural landscape would be retained on 39,040 acres and modified on 58,845 acres.
Alternative 5	The natural landscape would be retained on 16,000 acres and modified on 81,885 acres.

CULTURAL RESOURCES	Cultural resources are managed under the Antiquities Act of 1906, the National Historic Preservation Act of 1966, the Archaeological and Historical Conservation Act of 1974, and the Archaeological Resource Protection Act of 1979.
Alternative 1 Preferred -2	These alternatives would possess no development. The potential risk of damage to cultural resources would be slight.
Alternative 3	Generally, the risk of damage to cultural resources increases with development and access, so this alternative would possess the greatest risk to the cultural resources. Project work would continue to require inventory of sites and implementation of appropriate mitigating measures.
Alternative 4-5	These alternatives would possess moderate development. Areas allocated to intensive management activities would have the greatest risk. Project inventory and evaluation would continue.

WILDERNESS

National Forest System Wilderness is managed under the Wilderness Act of 1964, and the Code of Federal Regulations - Title 36 Part 293 - Wilderness and Primitive Areas - to preserve its natural condition. Wilderness study areas are managed to protect their wilderness character until Congress decides on their classification.

Issues

- What are the wilderness attributes of the study areas and to what extent are they needed for wilderness?
- What considerations should be given to a diversified National Wilderness Preservation System when proposing lands for wilderness?
- What other Federal lands are classified or proposed as wilderness or are under study as wilderness in the surrounding area and to what extent should they influence the classification of the study areas?

WARS

Wilderness quality is reflected by the WARS (Wilderness Attribute Rating System). The 28-point rating system evaluates the area on natural integrity, apparent naturalness, solitude opportunity, and primitive recreation setting. Big Snowies received a rating of 24 under this system. This rating reflects some disruption of natural integrity.

Unique Ecosystem & Wildlife Species

In the RARE II analysis (Step 3), Big Snowies was identified as one area that contains the Foothills Prairie Ecosystem. Within the northwest corner of the study area, there are 3,650 acres of this ecosystem. The study area was not selected to fill a target for wilderness-associated wildlife species representation.

Relationship to Other Wilderness Areas

Within 250 miles of the Big Snowies Wilderness Study Area are 2.8 million acres of classified wilderness. There are also several areas which are being studied for possible wilderness classification by the Forest Service and Bureau of Land Management. The Big Snowies would provide weekend visitation opportunities from the population centers of Great Falls, Lewistown, and Billings.

Comparison

Table M2.4 displays the acres of recommended wilderness by alternative. Primitive recreation takes place within classified wilderness and this opportunity is also shown in the table.

BIG SNOWIES Alternative Comparison

Alternative 1 Preferred	The Big Snowies would be managed for semi-primitive recreation opportunities. The area's character would be protected.
Alternative 2	Wilderness classification would add 97,885 acres to the National Wilderness Preservation System.
Alternative 3	The opportunity for wilderness classification would be foregone on all 97,885 acres.
Alternative 4	The opportunity for wilderness classification would be foregone on 58,845 acres. The opportunity would be retained on 39,040 acres.
Alternative 5	The opportunity for wilderness classification would be foregone on 81,885 acres. The opportunity would be retained on 16,000 acres.

WILDLIFE AND FISH

Major big game species in the Big Snowies are mule deer, black bear, and mountain goat. Elk numbers have been increasing gradually in the northern portion of the range and now provide some limited hunting. White-tailed deer inhabit some of the lower elevation lands.

Bald eagles, an endangered species, are known to use the area during spring and fall migrations.

Small game species in the area include blue grouse and ruffed grouse. A few flocks of Merriam's turkey are found in the southern portion of the area. Numerous non-game species in the Big Snowies include mountain lion, coyote, bobcat, golden eagle, and prairie falcon.

Opportunities are available for habitat improvement to enhance spring/fall ranges for deer and elk. Fishable streams are virtually non-existent.

Issues

- What are the principle game, nongame, and threatened and endangered species and what are the opportunities for habitat improvement?

Comparison

Figures M2.25 and M2.26 display elk popultion and wildlife habitat improvement for the first and fifth decades by alternative.

FIGURE M2.25
ELK HUNTER DAYS

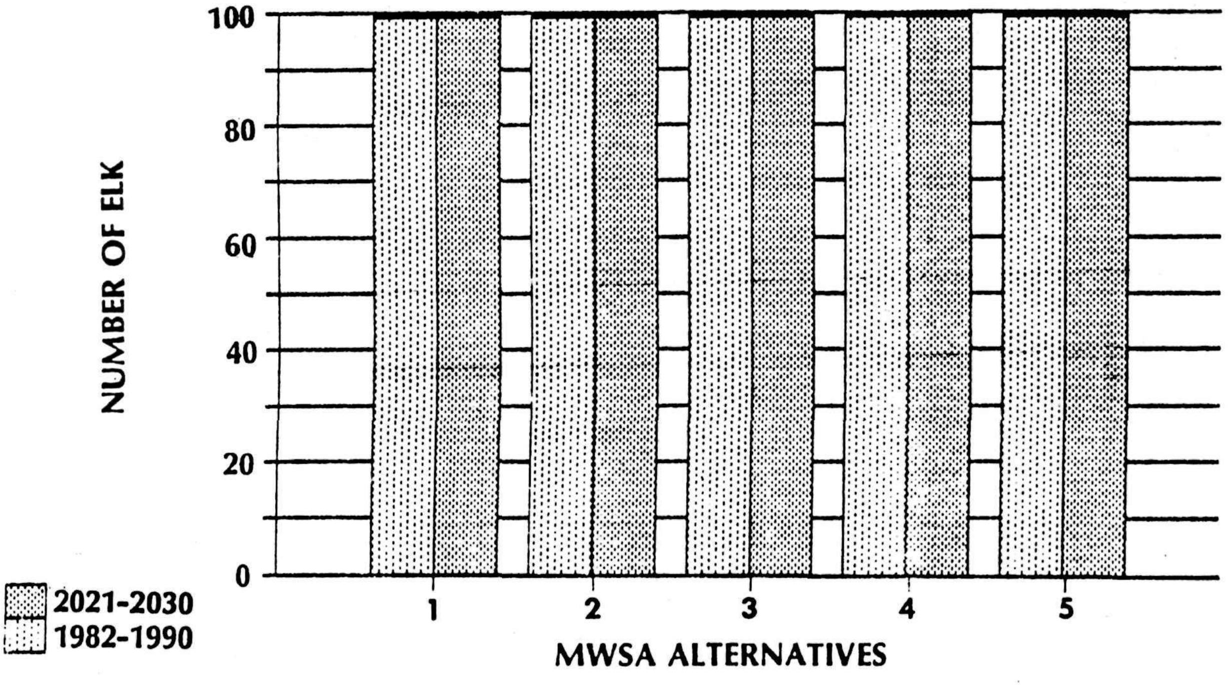
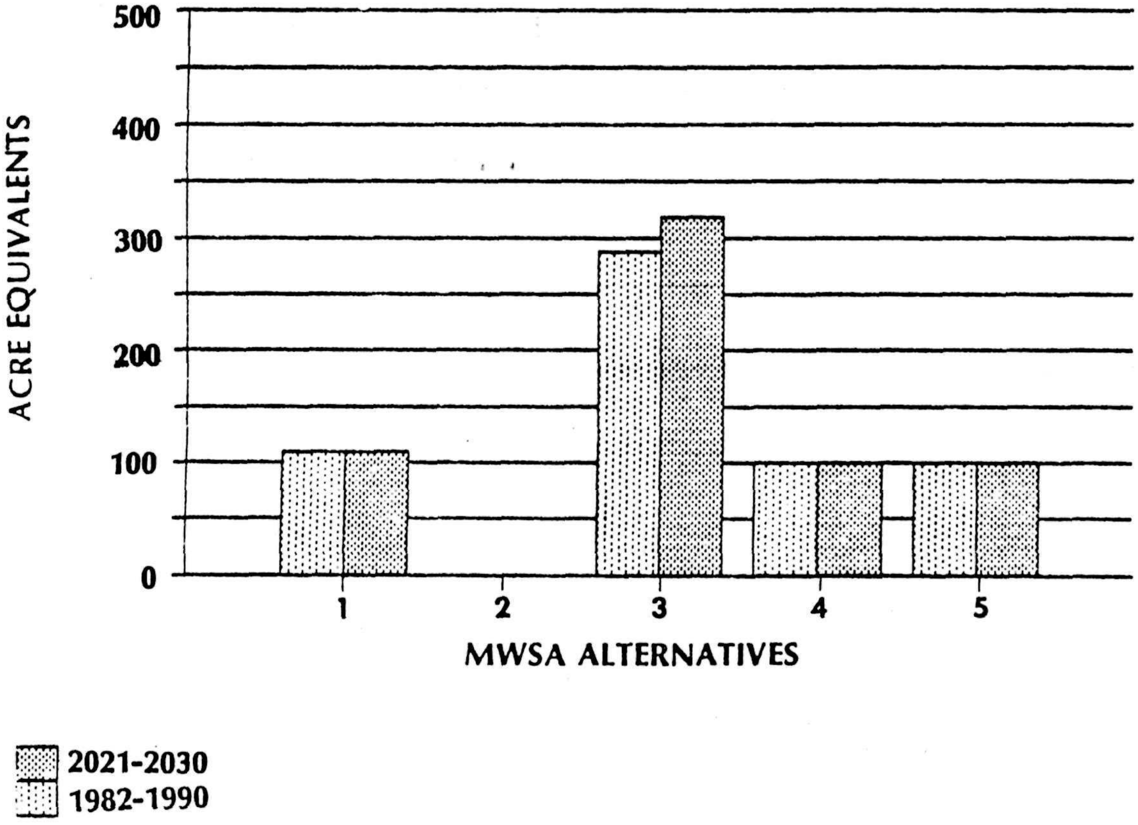


FIGURE M2.26

WILDLIFE HABITAT IMPROVEMENT



Alternative 1 Preferred	This alternative would favor animals that prefer late successional vegetation. Security cover for elk and deer and hunting opportunities would be maintained. Fire and other vegetative manipulation would be used to improve spring and fall elk and deer habitat.
Alternative 2	Native wildlife species and their habitat are an integral part of the wilderness resource. Management of wildlife and wildlife habitat would be secondary to management of the wilderness resource. Wilderness classification tends to favor animals that prefer late successional vegetation.
Alternative 3	This alternative would favor animals that prefer early successional vegetation. Security habitat for elk would be reduced. Hunting opportunities for both elk and deer would decrease. These effects may be offset by road closures.

Alternative 4-5

In the upper elevations, security habitat for elk and deer would be retained. Hunting opportunities would remain the same. In the lower elevations security habitat for elk and deer would be reduced. This could be offset by road closures.

RANGE

The forage in the study area plays an important part in rounding out local ranch operations, as well as providing feed for big game animals.

Twelve permittees have grazing permits for 867 cattle and 900 sheep annually. They graze a total of 2,200 AUMs yearly. There are twenty miles of fence and twenty spring developments on National Forest lands in the Big Snowies.

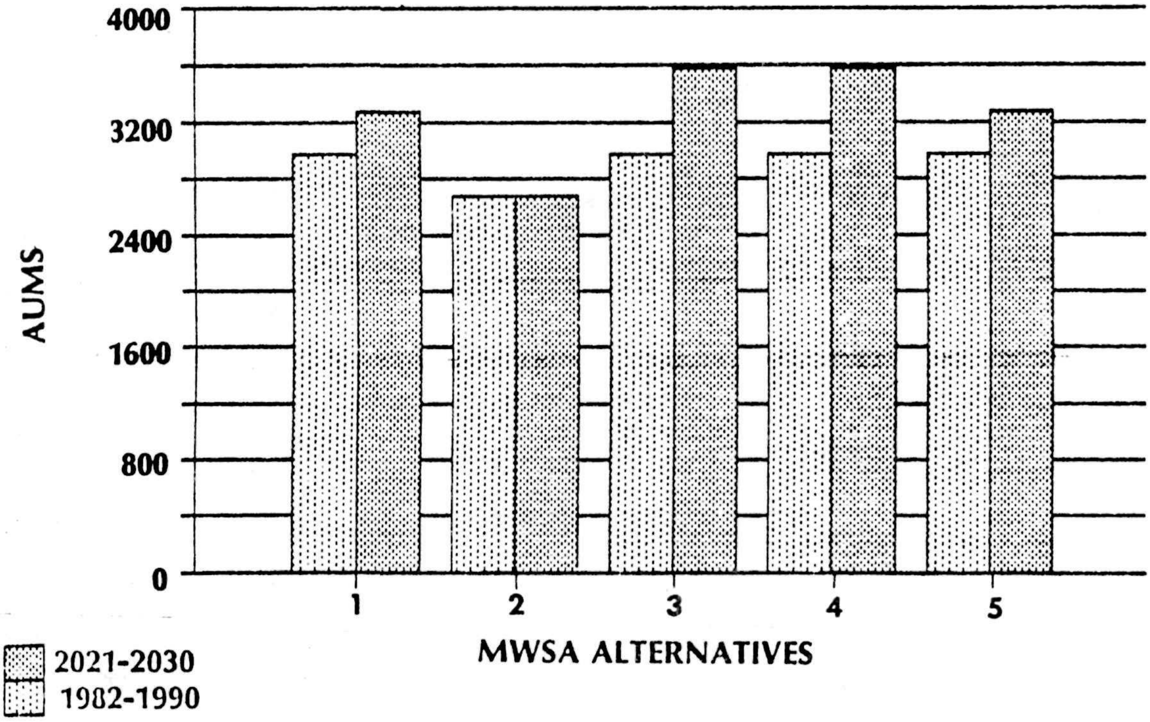
Issues

- What is the present range use of the areas and what is the potential for that use?

Comparison

Figure M2.27 displays the number of AUMs provided for domestic livestock grazing in the first and fith decades by alternative.

FIGURE M2.27
RANGE



Alternative 1 - Preferred 5

Domestic grazing would increase by 600 AUMs.

Alternative 2

Domestic grazing would not change.

Alternative 3 - 4

Domestic grazing would increase by 900 AUMs.

TIMBER

Approximately 50,000 acres or 51 percent of the study area is classified as commercial forest. Productivity is less than average for the Forest and below average for eastern Montana. Lodgepole pine and Douglas fir are the principal species. Most of the lodgepole pine stands are pole size, whereas the Douglas fir stands are sawlog size.

Current use for firewood is low because of limited access.

Issues

- What is the timber potential of the area and where is timber management appropriate?

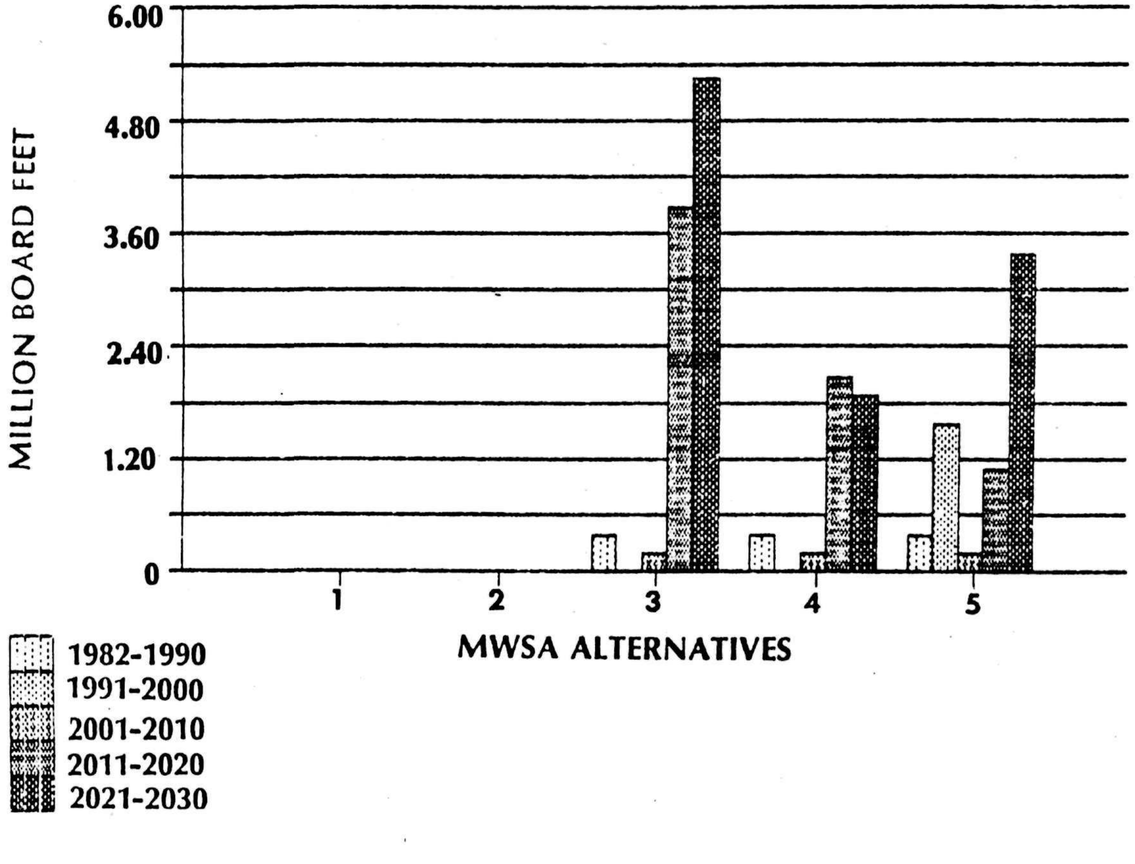
- What is the present use, location, and opportunities for cutting household firewood and what other energy needs, such as powerline corridors, should be considered?

Comparison

Figure M2.28 displays the harvest volumes for five decades by alternative.

FIGURE M2.28

ANNUAL TIMBER HARVEST PROGRAM



Alternative 1 **Preferred**	Under this alternative, no timber would be harvested. Firewood removal would remain the same.
Alternative 2	The Wilderness Act prohibits timber harvest. Trees would not be cut for nonwilderness purposes, with the exception of prospecting, mining, and insect and disease control.
Alternative 3	Under this alternative, about 98 million board feet of timber would be harvested during the 50-year planning period. By 2030, approximately 5.3 million board feet would be harvested annually. Additional opportunities for firewood removal would be available.
Alternative 4	Under this alternative, about 46 million board feet of timber would be harvested during the 50-year planning period. By 2030, approximately 1.9 million board feet would be harvested annually. Additional opportunities for firewood removal would be available.
Alternative 5	Under this alternative, about 67 million board feet of timber would be harvested during the 50-year planning period. By 2030, approximately 3.4 million board feet would be harvested annually. Additional opportunities for firewood removal would be available.

SOILS AND WATER	Watershed condition in the study area is generally good. The Big Snowies basins were formed by slumping at the head of larger drainages and are generally sensitive to soil disturbing activities. Other parts of the drainage are stable.
Issues	- What are the present conditions and uses of the areas watershed, and what is its relative sensitivity to development activities?
Alternative 1 **Preferred**	The watershed would remain undeveloped. Water quality would remain high. A full range of restoration practices could be used after a natural disaster.
Alternative 2	The watershed would remain essentially undeveloped. Water quality would remain high. The exclusion of motorized vehicle would, over time, return the watershed to a pristine condition. Wilderness classification would limit the kinds and extent of watershed restoration practices that would be used after a natural disaster, such as a flood or forest fire.
Alternative 3 4-5	All or part of the watershed would be developed. The stable watershed and soil insensitivity to roading and logging make the Big Snowies suitable for development at lower elevations. The quality and quantity of water produced would continue to provide for its continued use of irrigation and water livestock. A full range of restoration practices may be used after a natural disaster.

MINERALS

The past and present mineral activity for base and precious metals has been minimal. Likewise, the potential for future activity also appears to be minimal.

The fringes of the range may have a potential for oil and gas accumulation. These areas recently are under application for oil and gas leasing. Currently there is oil shale and mineral exploration in the Heath Shale at the foot of the range. Oil shale exploration in the Heath formation will probably be confined to the foothill fringe and will not directly affect the study area.

Issues

- What is hardrock, oil, and gas potential of the area and how should they be managed for that potential?

Alternative 1
Preferred

Mineral development is governed by mining and mineral leasing laws. No additional roads would be built for management of surface resources under this alternative.

Alternative 2

Until December 31, 1983, the United States mining laws and all laws pertaining to mineral leasing apply to National Forest wilderness to the same extent as they applied to the area prior to its classification. Effective January 1, 1984, subject to existing rights, the minerals in land designated as wilderness are withdrawn from all forms of appropriation under the mining laws pertaining to mineral leasing.

Alternative 3 - 4 - 5

Mineral development is governed by mining and mineral leasing laws. Roading would increase the opportunities to explore and develop mineral resources. The most roads would be constructed under Alternative 3; the least under Alternative 5.

LANDS

The study area includes 100 acres of private land located on the periphery of the study area. The study area and adjacent National Forest System lands are bounded by private land.

An electronic site, located on West Park, provides communications for a variety of users. Because the topography of the study areas is much higher than the surrounding area, it provides several ideal electronic sites. The Forest has an application pending for a second electronic site. A buried water line is under special use permit in Halfmoon Canyon.

Issues

- What is the present landownership pattern, current access, and use? What is the opportunity for acquisition or to manage potential wilderness in-holdings?

- What other energy needs, such as powerline corridors, should be considered?

All Alternatives

There would be no need to acquire any private in-holdings.

No need is apparent for other facilities such as power transmission lines. Valleys to the east and west are more suitable for this use.

Under all alternativs, the electronic site and waterline may be retained, if in the opinion of the Regional Forester, its continued use would be in the public's interest.

Under Alternative 2 (wilderness), no new sites would be designated. Under the other alternatives, other special use permits may be issued, if in the public interest.

FACILITIES - ROADS AND TRAILS

The study area contains 50 miles of low standard roads. Thirty-six miles can be negotiated with 2-wheel drive vehicles, and fourteen miles require 4-wheel drive vehicles. There are 80 miles of fair to poor trails in the study area. Public access through surrounding private lands is an issue, as there are only two public entry points on the south and one on the north of the Big Snowies.

Issues

- What type, condition, and amount of road and trail access do the areas contain and what is the potential for roaded form of access?

- What is the present use, location, and opportunities for cutting household firewood and what other energy needs, such as powerline corridors, should be considered?

Comparison

Figures M2.29 and M2.30 show the miles of arterial and collector roads and local roads for five decades by alternative.

FIGURE M2.29

ARTERIAL AND COLLECTOR ROADS

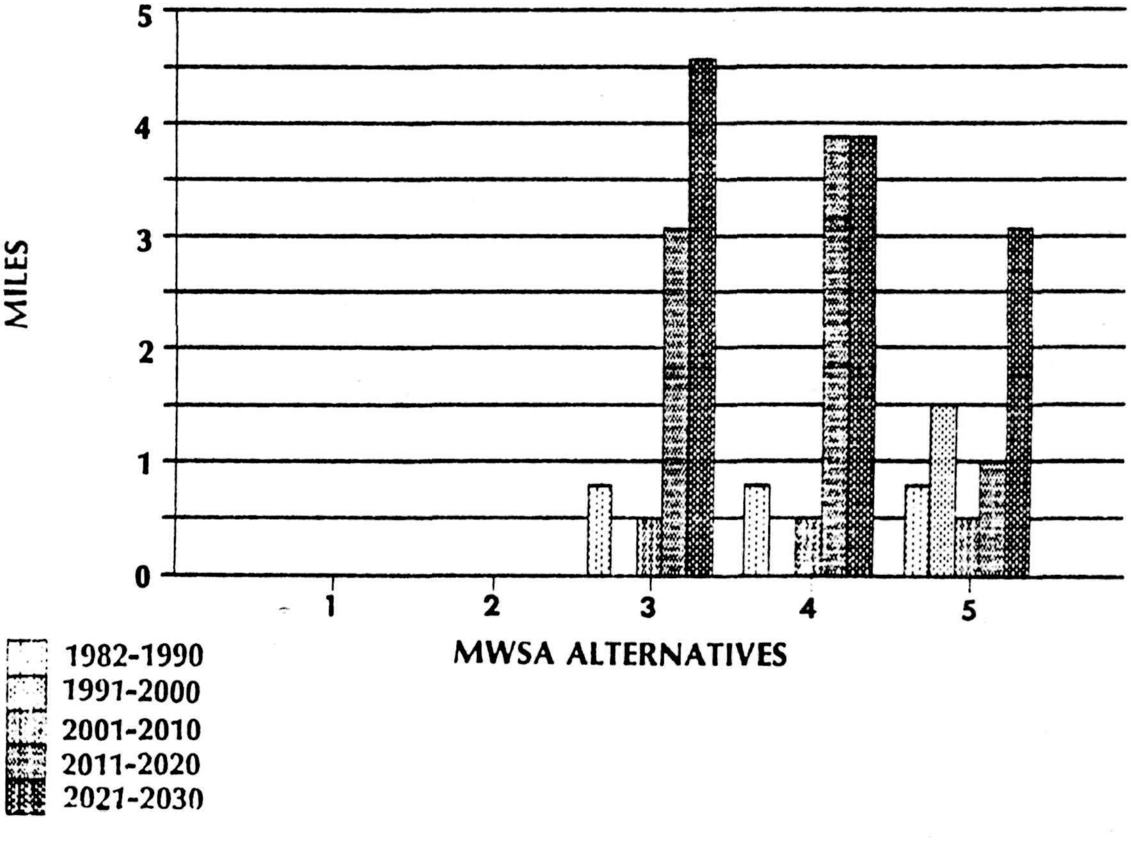
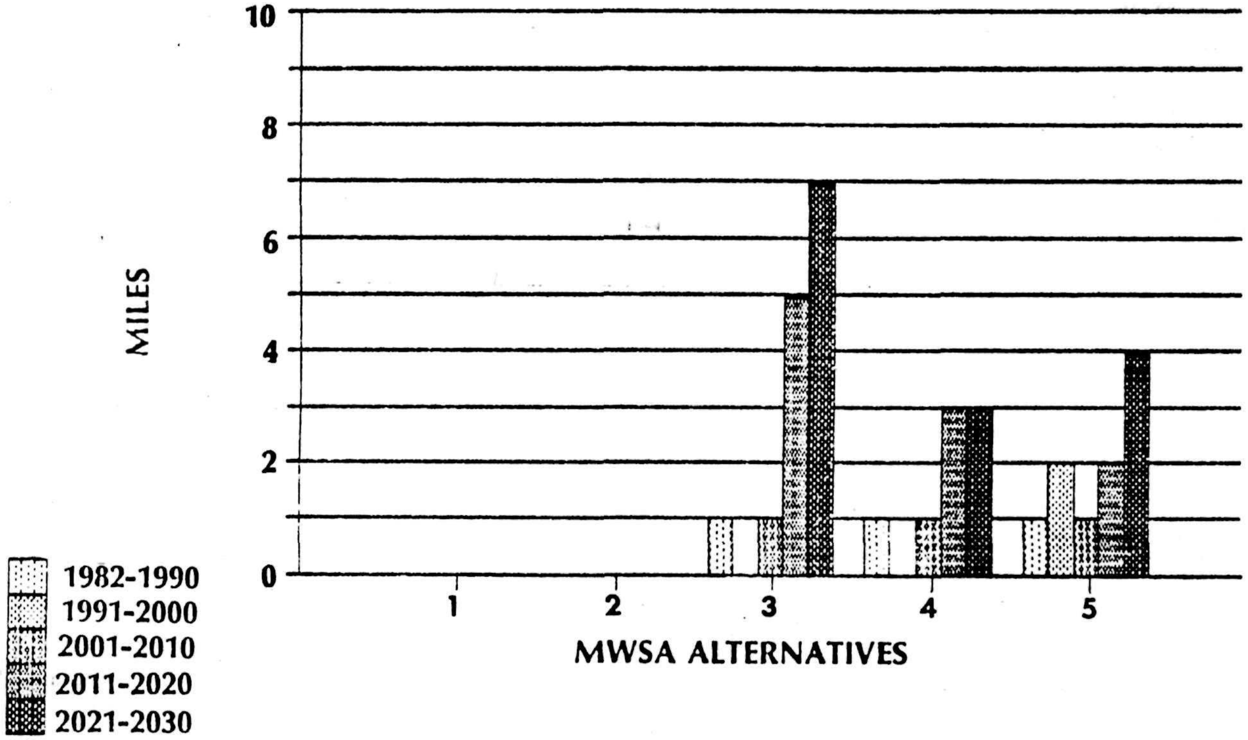


FIGURE M2.30
LOCAL ROADS



Alternative 1 Preferred	The existing 50 miles of roads would not be maintained. The 80 miles of trails would be maintained. Approximately 20 miles of rights-of-way would be needed.
Alternative 2	The 50 miles of existing roads would be closed and rehabilitated. Natural processes would be favored. All 80 miles of trail would be retained for wilderness use and management.
Alternative 3 4	Under these alternatives, 90 miles of arterial and collector roads would be constructed. They would require 48 miles of rights-of-way across private land. In addition, 140 miles of local roads would be built under Alternative 2, and 80 miles under Alternative 3. Approximately 45 miles of trail would be retained under Alternative 2, and 50 miles under Alternative 4.
Alternative 5	Under this alternative, 69 miles of arterial and collector roads would be constructed. In addition, 100 miles of local roads would be built. Approximately 64 miles of trail would be retained and 16 miles would be replaced by road. Road right-of-way across private land would be required.

PROTECTION - FIRE	All fires are suppressed as quickly as possible. As a result, there is a high occurrence of natural fuels. Fuel build-up varies from a low of 10 tons per acre to a high of 60 tons per acre. During extreme fire conditions a start could result in a major holocaust. Access is limited and potential for a major burn is great.
Issues	- What is the present condition and the potential for serious fire. What are the current protection measures and what measures are needed?
Alternative 1	A Fire Management Plan, which uses both planned and unplanned ignitions to obtain recreation and wildlife objectives, would be developed.
Alternative 2	A Fire Management Plan, which may allow fires started by natural causes to burn within prescription, would be developed. Fire resulting from person-cause activities would be prevented and/or controlled at all times.
Alternative 3 - 4	All unplanned fires would be suppressed. Prescribed fire with planned ignitions would be used to reduce timber harvest slash and improve wildlife and range habitat.
Alternative 5	All unplanned fire in the upper would be suppressed. Prescribed fire would be used to reduce timber harvest slash and improve wildlife and range habitat. A Fire Management Plan, which uses fires to obtain recreation, range, and wildlife objectives, would be developed for the rest of the area.

PROTECTION - INSECT AND DISEASE	Currently there are no epidemic insect problems. Some epidemic mountain pine beetle infestation exists on adjacent lands, particularly to the east in the Little Snowies. Infestation is expected to occur within 5-10 years in the lodgepole and ponderosa pine. Other pests include Douglas fire beetle, spruce beetle, western balsam bark beetle, and spruce budworm. None of these are current threats and no major outbreaks are expected.
Issues	- What is the present condition and the potential for serious insect and disease infestation? What are the current protection measures, and what measures are needed?
Alternative 1 Preferred	Insect and plant disease outbreaks would not be artificially controlled unless necessary to protect timber or other valuable vegetation outside of the area.
Alternative 2	In classified wilderness, insect and plant disease outbreaks are not artificially controlled unless necessary to protect timber or other valuable vegetation outside wilderness.
Alternative 3 - 4 - 5	Vegetation management would be directed to reduce losses from insect and plant disease on those lands that were developed. On lands that remain in a semi-primitive recreation setting, insect and plant disease outbreaks would not be artificially controlled unless necessary to protect timber or valuable vegetation outside of the area.

QUANTITATIVE ECONOMIC COMPARISON

Issues

- What resources do the areas contain and how should the study areas resource outputs be allocated toward meeting the RPA program goals?

- What considerations should be given to maintaining current employment levels for dependent communities?

The Big Snowies Wilderness Study Area is located in Fegus and Golden Valley counties. These counties are also heavily dependent on farming and ranching, although Lewistown is a small service center for central Montana. Golden Valley County is projected to have a slight decrease in population over the next 20 years while Fergus County is projected to have a slight increase.

National needs for goods and services are reflected in the objectives assigned to the Lewis and Clark National Forest by the RPA (Resource Planning Act) Program (see Table 2.2 in the Forest Plan EIS). Table M2.7 displays some of the contributions the Big Snowies makes in providing for recreation, range, timber, and wilderness needs.

Benefits

Benefit values were assigned to market outputs and selected nonmarket outputs. Dollar values were assigned to benefits from timber, range, recreation, and oil and gas leasing. These values are discussed under costs and benefits in the Alternative Formulation portion of this chapter.

Return to U.S. Government

This is the revenue the Forest collects from timber sales, grazing fees, timber purchasers road credits, sale area betterment collections, recreation fees, mineral leasing, and land use charges which is returned to the U.S. Treasury.

Return to State

By Federal law, 25 percent of this revenue is returned to the State for use by the counties for schools and roads. Counties' shares of the payment are determined by the acreage of National Forest within the county. In addition, counties receive PILT (payment in-lieu of taxes). PILT ranges from 10 cents to 75 cents per acre.

Costs

Forest Service costs are estimated for each alternative.

Table M2.8 displays the benefits and costs of the alternatives.

TABLE M2.8
BIG SNOWIES
ANNUAL BENEFITS AND COSTS

(Thousand Dollars)
(Values Given In 1978 Dollars)

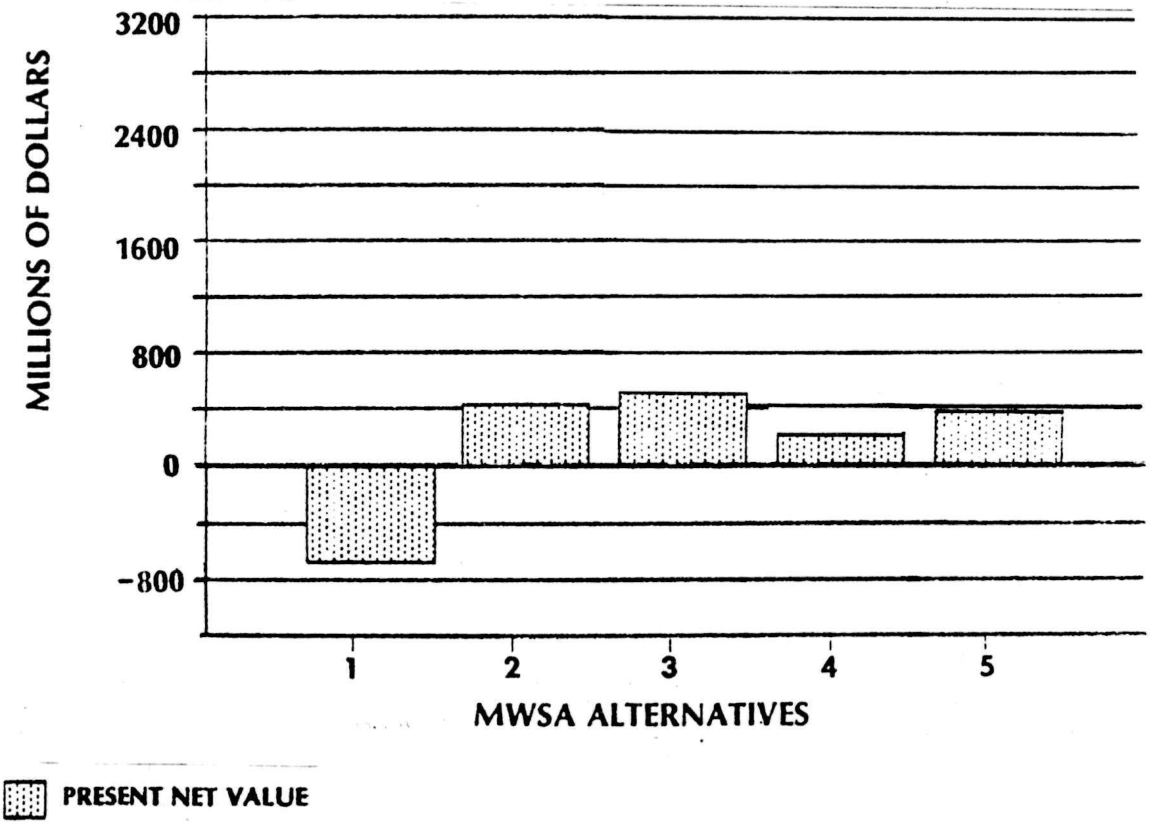
DECADE	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5
1982-1990					
Total Benefits	73.1	92.5	179.4	179.6	179.6
Returns To US Govt.	52.4	4.9	60.4	60.4	60.4
Total Costs	111.0	83.6	165.4	165.6	165.6
Total Net Benefits	-37.9	8.9	14.0	14.0	14.0
1991-2000					
Total Benefits	86.0	99.9	86.2	86.2	483.0
Returns To US Govt.	52.4	4.9	52.4	52.4	84.4
Total Costs	118.6	82.0	119.0	119.2	192.1
Total Net Benefits	-32.6	17.9	-32.8	-33.0	290.9
2001-2010					
Total Benefits	93.6	108.2	145.4	145.0	143.0
Returns to US Govt.	52.4	4.9	130.7	94.7	74.7
Total Costs	120.9	82.0	137.4	137.1	135.3
Total Net Benefits	-27.3	26.2	8.0	7.9	7.7
2011-2020					
Total Benefits	100.5	115.6	1065.6	619.4	372.2
Returns to US Govt.	52.4	4.9	130.7	94.7	74.7
Total Costs	120.9	82.0	258.5	236.5	171.0
Total Net Benefits	-21.5	33.6	807.1	382.9	201.2
2021-2030					
Total Benefits	106.2	123.9	2402.5	579.1	943.8
Returns to US Govt.	52.4	4.9	159.5	71.5	120.7
Total Costs	123.3	82.0	315.8	240.0	277.7
Total Net Benefits	-16.4	41.9	2086.7	339.1	666.1
PNV @ 4%	-677.4	427.7	558.1	151.2	341.0

PRESENT NET VALUE

PNV (present net value) is a economic evaluation tool useful in examining the economic differences between alternatives. PNV is the discounted benefit less discounted costs associated with providing all resource outputs associated with providing all resource outputs to which monetary value can be assigned, including both market and selected non-market outputs. PNV was calculated over a 50 year planning horizon because cost and benefit data were not available beyond this first 50 years for this area. The costs and benefits used in this calculation are mentioned in the Alternative Formulation portion of this chapter. Figure M2.31 displays PNV for each alternative.

The allocation and scheduling of acres in management prescriptions for each alternative was done by maximizing PNV in FORPLAN. This satisfied NFMA regulations which require each alternative represent the "most efficient combination of management practices examined that can meet the objectives established in the alternatives."

FIGURE M2.31
PRESENT NET VALUE



Alternative 1
Preferred

Alternative 1 has a negative PNV due to no revenues received from timber harvesting and recreation being valued at dispersed recreation at $3.00/RVD. The only commodity which generates revenue is range; however, some grazing is not cost efficient. This leads to a negative PNV because the benefits assigned to recreation RVDs (both dispersed and big game hunting) and grazing do not exceed the costs for operation and maintenance at that level of recreation and grazing.

Alternative 2

Alternative 2 ranks higher than Alternative 1 because of wilderness classification. This classification assigns a high value to primitive (wilderness) recreation ($8.00/RVD). Therefore, benefits from dispersed recreation are much greater than those from Alternative 1.

Alternative 3 - 4 - 5

Under these alternatives, PNV is higher because of timber harvesting. PNV increases in proportion to the increases in timber harvesting.*

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* When the analysis for this EIS was started the most recent data indicated the average price for timber was $42 per thousand board feet. Recently, the average price has been$27 per thousand board feet. An economic analysis using the most recent price would result in a lower PNV for alternatives which schedule harvesting.

EMPLOYMENT AND INCOME

Tables M2.9 and M2.10 display employment and income changes. These changes are based on increases in timber harvest and grazing levels. Projections were made based on an input/output model used for Forest Plan alternatives. The input/output model is described in the planning record, "Input/Output Model". The magnitude and effects of these changes are discussed in Chapter IV.

TABLE M2.9 CHANGE IN EMPLOYMENT BY ALTERNATIVE (PEOPLE)

TIME PERIOD	1	2	3	4	5
1982-1990	0	0	5	5	5
1991-2000	0	0	0	0	20
2001-2010	0	0	3	3	3
2011-2020	0	0	50	30	15
2021-2030	0	0	70	25	45

TABLE M2.10 CHANGES IN INCOME BY ALTERNATIVE (THOUSANDS OF DOLLARS)

TIME PERIOD	1	2	3	4	5
1982-1990	0	0	80	80	80
1991-2000	0	0	0	0	300
2001-2010	0	0	40	40	40
2011-2020	0	0	730	390	210
2021-2030	0	0	990	360	640

COMPARISON OF QUALITATIVE NET PUBLIC BENEFITS

Introduction

The interdisciplinary team evaluated the alternatives to determine which alternative maximized net public benefit. Net public benefit is important since it represents the overall value to the nation of all benefits less all costs, regardless of whether the costs and benefits are expressed in quantitative (PNV) or qualitative terms (often subjectively measured). The PNV component of each alternative's net public benefit is displayed in Table M2.8.

Each alternative is compared as to how well it addresses the qualitative components of net public benefit. The qualitative components of net public benefit include:

1) Elk Hunting Quality - The quality of big elk hunting varies by alternative. Currently elk hunting quality indicators include the length of the hunting season and the population structure of the animals harvested. Both quality indicators are influenced by the currently unroaded situation on the study area. Timber harvesting on elk hiding cover areas would have varying impacts on elk hunting quality. Each alternative was examined to determine its impact on elk hunting quality and whether or not the PNV trade-offs are acceptable.

2) Semi-Primitive Recreation Setting - According to public involvement comments the maintenance of a semi-primitive recreation setting in certain parts of the Forest is important to large segments of the public. The Big Snowies is highly valued for its semi-primitive recreation opportunity. Each alternative was examined in light of its impacts on these areas.

3) Visual Quality - Visual quality constraints have been included in the FORPLAN runs and therefore reduce the PNV. Whether the benefits produced exceed the costs involves a subjective component that needs to be considered in the qualitative net public benefit analysis.

4) Lifestyles and Business Stability - The opportunities for local people, ranchers, and small business to make use of the posts, poles, and/or firewood are not valued in the PNV. The maintenance of existing lifestyles of ranches and businesses are dependent on such Forest products. These opportunities vary by alternative.

Ranchers are also dependent on the current level of grazing. The stability for ranching lifestyle is not considered in the benefits assigned to domestic AUMs. This factor needs to be considered and weighed against any grazing inefficiencies.

Alternative 1
Preferred

Alternative 1 would maintain the quality of elk hunting. The population structure should be maintained or improved through habitat improvement practices.

The Big Snowies would maintain its semi-primitive recreation setting. Both motorized and non-motorized recreation would be permitted.

Visual quality would not be affected.

The opportunity to make use of posts, poles, and/or firewood would not change. Because grazing levels would increase slightly, the ranching lifestyle would be maintained.

Alternative 2

Alternative 2 would maintain the quality of elk hunting. No timber would be harvested. Grazing would not increase.

The Big Snowies would be managed as wilderness (primitive recreation setting). Motorized recreation would not be permitted.

Visual quality would not be affected.

The opportunity to make use of post, poles, and/or firewood would be foregone. Maintaining grazing at current levels would not affect the ranching lifestyle.

Alternative 3-4

Alternatives 3 and 4 would drastically lower the quality of elk hunting. Because most of the lands are accessed for timber, hiding cover would be reduced. With less hiding cover, animals would be harvested quickly and fewer mature animals would be available.

Alternative 3 would not retain any of the area in a semi-primitive recreation setting. Alternative 4 would retain 16,000 acres in a semi-primitive recreation setting.

Alternatives 3 and 4 affect visual quality the most. They contain the most acres in the modification class.

The opportunity to make use of posts, poles, and/or firewood would increase. Increasing the level of grazing would ensure a stable ranching lifestyle.

Alternative 5

Alternative 5 would lower the quality of elk hunting slightly. The lower Big Snowies would be accessed. The upper lands would remain undeveloped. Timber harvest would cause some easier and quicker access to elk.

Alternative 5 would retain 39,100 acres in a semi-primitive recreation setting.

Alternative 5 would affect the visual quality on 58,800 acres.

The opportunity to make use of posts, poles, and/or firewood would increase slightly. The slight increase in grazing would help maintain a stable ranching lifestyle.

DEIS
SECTION 2
MONTANA WILDERNESS STUDY ACT AREAS

CHAPTER III
AFFECTED ENVIRONMENT

Overview

This chapter briefly describes the various environments of the Montana Wilderness Study Areas. The environments described are those which would be affected by the various alternatives. Chapter IV, "Environmental Consequences", describes the significance of these effects.

The first portion of this chapter deals with the Middle Fork Judith; the second portion with the Big Snowies.

GENERAL DESCRIPTION

The Middle Fork Judith Wilderness Study Area is in Judith Basin County. It encompasses an area about 16 miles long and 9 miles in width. Its boundaries are defined by roads, mines, and hydrological divides. The area contains most of the Middle and Lost Forks of the Judith River. Prominent landscape features are the headwater basins of these two streams. Elevations range from 5,000 to 8,500 feet. At the higher elevations, the mountains are blanketed with lodgepole pine; Douglas fir predominates at the lower elevations. Pockets of spruce are found amidst the Douglas fir and along the creek bottoms. White bark pine and subalpine fir are found on poorer growing sites and at higher elevations.

Except for 1,154 acres along the Middle Fork of the Judith and 194 acres of small tracts along the west and north boundaries, the study area is federally owned and managed by the Lewis and Clark National Forest.

For the most part, the topography is gentle to moderate rolling, with open parks and stringer type meadows. These are punctuated with limestone cliffs and outcrops. In the lower eastern portion of the study area, narrow and picturesque multicolored limestone canyons offer a unique geologic feature that cannot be found in the immediate vicinity.

The area also abounds in history and lore. Western artist Charles Russell painted and wrote about many of the places in this area. The Yogo Sapphire mines (the sapphires in the Crown Jewels of England were mined there), are just outside the northern boundary of the study area. Old Yogo Town, where the discovery of gold started a gold rush, is located adjacent to the study area. The gold rush was quickly ended when Indians drove the miners out. Even earlier history is recorded in the numerous limestone cliffs containing fossils of early sea and animal life. Indians frequented the area even before the miners and left evidence of their presence.

RECREATION

Dispersed Recreation

Recreation use of the study area is dispersed. The major recreation activities are big and small game hunting and fishing along the Middle and Lost Forks. These activities are expected to remain the major recreation activities in the future. Hunter camps, although found throughout the study area, are concentrated along the Middle and Lost Forks. Because of the numerous primitive roads, hunters tend to use 4-wheel drive vehicles rather than horses. However, local outfitters still use horses.

Backpacking is limited and usually consists of day hikes by fishermen and hunters. Most of the back-country camping is done by these two groups and is of short duration. Approximately 10,800 RVDs (recreation visitor days) of non-motorized recreation takes place annually.

Motorized Recreation

Use of 4-wheel drive vehicles and trail vehicles is extensive and extremely popular. There are about 74 miles of trail. No doubt, some of the steep hills are well suited for testing the capabilities of the trailbike and its driver. In addition, approximately 52 miles of primitive roads are passable for the most part only by 4-wheel drive vehicles. These roads are not confined to gentle ridges and valley bottoms, but cross steep ridges, muddy areas, and narrow canyons. The Middle Fork road follows the river bottom most of its length and fords the creek numerous times. Besides primitive roads about 12 miles of low standard roads are useable by pickup trucks. Motorized recreation accounts for about 10,000 RVDs yearly.

Scenic Beauty

Scenic views from ridgetops and Yogo Peak, the highest point offering the most spectacular view of the area, can be reached by a combination of vehicles and a short hike. Multicolored, narrow limestone canyons in the lower or eastern end of the study area also draw many recreationists to the area.

Winter Use

During the winter some snowmobiling and cross country skiing take place. Both activities are limited by poor access and rugged terrain. Nevertheless, approximately 800 RVDs of non-motorized recreation and 1,800 RVDs of motorized recreation do take place during the winter.

WILDERNESS

Wilderness Character

The Middle Fork Judith Study Area is essentially a natural environment. The topography is varied and scenic. It is rolling and gentle in some areas and rugged in others. The study area for the most part has retained its original character and man's influence, with a few exceptions, has been minimal. The sights and sounds of man can, and do, penetrate the area.

Trails throughout the study area, unimproved roads on ridges and valley bottoms, livestock grazing along stream bottoms, sheep grazing on the ridges, pasture and drift fences along the Middle and Lost Fork bottoms, and structural developments on private land are present and affect the quality of the natural environment on approximately 15 percent of the study area.

Opportunities exist for primitive types of recreation, such as fishing and hunting which are popular in the study area. Most of this activity is concentrated in relatively few locations. The greatest hunting pressures are on ridges that can be accessed with 4-wheel drive vehicles and the Middle and Lost Forks. Most fishing is also done in the Middle and Lost Forks and their major tributaries. Backpacking is relatively limited and is usually day hiking by fishermen and hunters. There are opportunities for cross-country skiing, but due to poor access and rugged terrain, little is done. Compared to other areas in the Little Belts, the study area rates average or below average for primitive recreation use.

Scenic Beauty

Opportunities for scenic beauty are available in various parts of the study area. One of the most spectacular views of the area is from Yogo Peak. Although it is the highest point, it is on the boundary and can be reached via 2-wheel drive vehicle and a 1/4 mile hike. Other views of the valley bottoms can be seen from the frequent meadows along gentle ridgetops. Many of these ridges can be reached by 4-wheel drive vehicles and trailbikes. All but 10 miles of these roads have been recently closed to such use. There are also multicolored, rugged, narrow limestone canyons in the lower (eastern) end of the study area.

Solitude

Opportunities for solitude are available in the study area. These opportunities can be marred by the concentrations of people in the canyon area, particularly in the Middle and Lost Forks.

Apparent Naturalness

Compared to other areas in the Little Belts, portions of the Middle Fork Judith Study Area rate as average or below average for apparent naturalness. Man's influence is most apparent in three geographic areas on the boundary of the study area. The first, the Weatherwax/Harrison Creek area, is located on the southwestern edge of the study area. Timber was harvested in two areas in the late 1960's and early 1970's. As a result, there are approximately 13 clearcuts and 4.6 miles of high standard roads. A summer home, a major powerline, and mineral exploration areas are also included in this part of the area study area. These impacts are readily apparent.

The second area, Grendah Mountain, is located on the western edge and has been subjected to mineral exploration and small scale mining for silver, gold, and lead since the late 1800's. These impacts are readily apparent.

The third area, Yogo Peak, like Grendah, has had intensive mineral prospecting and small scale mining. Located on the northern boundary, it encompasses the old mining town of Yogo Town, four patented claims occupying about 80 acres, and more than 30 unpatented claims. Recently, fairly extensive mining for molybdenum has taken place in the Yogo Peak area. These activities and developments have been accompanied by roads. These impacts are readily apparent.

WILDLIFE AND FISH

A wide variety of wildlife use the Middle Fork Judith Wilderness Study Area. The study area provides habitat for elk, mule deer, grouse, and black bear. Limited numbers of white-tailed deer and mountain lion are found in portions of the area. Non-game species include wolverine, lynx, golden eagle, and prairie falcon. The bald eagle is the only endangered species known to use the area.

T & E Species

Bald eagles, an endangered species, are occasionally seen during spring and fall migrations, but are not known to nest in the area. Suitable, unoccupied nesting habitat for peregrine falcon has been identified at the confluence of the Lost Fork and Middle Fork of the Judith River. However, there are no reports of peregrines being observed in the study area in recent years.

Elk

Elk are well distributed throughout the study area. They were planted in the Little Belt Mountains in 1915 and again in 1928 and have done extremely well. The herd has been one of the most prolific in the State, at times having a cow-calf ratio of over 50 percent. Elk numbers are now estimated at 1,200 elk. Spring/summer/fall range for elk is found throughout the area. During the fall, elk migrate across the northeastern portion of the study area to the winter range on the Judith River Game Range. This State-operated game range is adjacent to the study area on the eastern edge.

Wildlife Habitat

Opportunities are available to maintain or improve spring/fall ranges for elk and mule deer at lower elevations in the eastern portion of the area. Since elk and deer require early stages of plant succession for much of their food, prescribed *burning or other methods of vegetative manipulation* would be needed to maintain early successional stages.

Fish Habitat

Some limited opportunities for fish habitat improvement also exist on the larger streams. Most of the streams in this area support a small population of native trout; however, their accessible reaches are usually supplemented with hatchery fish to increase fisherman success. The Middle Fork and its main tributaries provide over 29 miles of fisheries for cutthroat and rainbow trout. The Upper Lost Fork contains a strain of native cutthroat.

RANGE

Grazing

The study area contains approximately 9,800 acres of suitable domestic livestock range. Presently, 900 animal unit months (AUMs) are permitted for domestic livestock. Five permittees graze 250 cattle or horses annually. Although grazing for 2,400 sheep is permitted, the permittees have not used the area in several years. A new allotment management plan for this area is under preparation which will provide for some sheep grazing.

The forage in the study area plays an important part in rounding out local ranch operations, as well as providing feed for big game animals, particularly elk. The majority of the range comes from permanent type natural parks, meadows, or grasses along streams.

Competition

Previously, keen competition between elk and cattle for forage has existed, especially along the Middle and Lost Forks. Intensive range management in the form of deferred and rest rotations grazing systems has improved the range and mitigated some of the competition for forage.

Improvements

On the current allotments, there are 10 miles of fence and 5 spring developments within the study area.

TIMBER

Commercial Forest

The lower elevations and foothills of the study area are blanketed with Douglas fir; at higher elevations, lodgepole pine is predominant. Although Douglas fir and lodgepole pine are the principle species, spruce can be found in small patches along the creek bottoms and ponderosa pine on the dryer slopes. Whitebark pine and species such as subalpine fir are found on poorer growing sites and in the subalpine region. Approximately 53,500 acres or 59 percent of the area is classified as commercial forest land.

Timber Sales

Since wilderness study began, no timber sales have been programmed within the study area. Past timber harvesting has taken place adjacent to the Middle Fork Ranch and in the Weatherwax/Harrison Creek area.

Productivity

Site productivity is average when compared to other sites on the Lewis and Clark National Forest. The areas most suitable for timber management are in the upper basins of Middle Fork and Lost Fork. On other areas, steep and rocky terrain, the need for an extensive road system, and long adverse hauls would make it difficult to harvest wood products.

Firewood

Present use for firewood cutting in the Middle Fork Judith is low due to limited and difficult access.

SOILS AND WATER

Soils

Watershed condition in the study area is generally good. The Middle Fork Judith has a very stable watershed and is relatively insensitive to roading or logging.

Climate

The climate is characterized by constant winds and sudden changes in temperature. The annual precipitation, mostly snow, ranges from 16 inches in the lowlands to 22 inches at the higher elevations. Warm chinook winds help break the occasional cold spells and reduce accumulated snowfall. The majority of the rain comes in May and June.

Water

The Middle Fork of the Judith River is the only year round stream which flows from the eastside of the Little Belt Mountains. The stream runs in an easterly and northeasterly direction, and flows into the Judith River which drains into the Missouri River. The Upper Judith River Watershed has an average discharge of 50.1 cubic feet/second just below the Forest boundary. Farmers and ranchers are dependent on this mountain water supply for irrigation, livestock, and household use. Of these, irrigation during the mid- and late summer is the largest use. Water is also provided for Ackley Reservoir which was built in 1938 for irrigation and serves about 6,000 acres.

Water Storage

No known water storage projects are planned in the study area and the potential for such a project is low or non-existent.

MINERALS

Geology

In general, the geology of the study area consists of thick bedded, massive, tan colored limestone and dolomites of the Devonian Jefferson Formation and the Mississippian Madison Group. The carbonate rocks were deposited in a marine environment from 300 to 400 million years ago. Beginning about 70 million years ago, a mountain building episode known as the Laramide Orogeny produced the Little Belt Mountains. The entire area was domed up, with the Neihart-Moose Creek area forming the core of the dome. Igneous rocks intruded into the existing sedimentary rocks and significant deposits of silver, lead, and zinc were formed. The flat-lying sedimentary rocks of the Lost and Middle Fork area were gently tilted toward the east. Subsequent erosion by the Lost and Middle Fork of the Judith River produced the landscape we see today.

Claims

There are approximately 150 prospects and mines within the study area. Private land (patented mining claims) total about 194 acres.

Development

Since the late 1800's, small scale mining for silver, gold, and lead has taken place. An old mining town, Yogo Town, lies along the northern border of the study area.

Yogo Peak and Grandah Mountain continue to be areas with mineral activity. These two areas have undergone a variety of mineral development including past and present claiming, exploratory drilling, geophysical surveying, and minor production.

Opportunities

The famed Yogo sapphire mine lies partially in the northeast corner of the study area. This sapphire-bearing rock extends from the American mine on Yogo Creek into Kelly and Richard Coulee. Here sapphire mining has been sporadically active depending on market prices. Mineral development opportunities still exist in the Grendah Mountain, Yogo Peak, and at the head of the Lost Fork.

Evidence indicates that lead, silver, and molybdenite still exist in quantity, but at long distances from milling sites. Present prices and the haul distance over poor roads restrict the development of these areas. Placer gold occurrences along portions of Yogo, Lead, and Boulder Creek could also be of significant importance. Building stone operations are also possible in the vicinity of Yogo Peak. Little or no oil and gas potential exists within the study area. About 4,770 acres are under consideration for oil and gas leasing.

LANDS

Private Land

There are 1,154 acres of contiguous private inholdings in multiple ownership in the Middle Fork and 194 acres in smaller peripheral mineral claims on the west and north boundary. Major use of private land in-holdings in the Middle Fork is grazing, dude ranch headquarters, and recreational use. The Forest is currently studying a land exchange for part of the private lands.

FACILITIES

Access

Access is possible via ridge roads to mineral claims and by primitive roads over Studhorse Hill and in and out of stream channels to private inholdings. The study area contains 52 miles of primitive roads, 12 miles of low standard roads, and 74 miles of trails. Currently, the exterior road system is inadequate. It does not provide for good connections to the present trail system or good user distribution.

Energy Corridors

One transmission corridor passes through the southwestern corner of the study area. No known plans exist for other corridors.

PROTECTION

Fire

All fires are suppressed as quickly as possible. Because most of the study area is composed of old growth stands, the occurrence of natural fuel is high. Given extreme fire conditions, a fire ignited in heavy fuels would probably burn an entire drainage.

Insect & Disease

Mountain pine beetle and western spruce budworm pose the greatest threat in the study area. Old growth lodgepole pine stands are the most susceptible to mountain pine beetle. This beetle reached epidemic levels in 1964 and has persisted since then. Although Douglas fir beetle and spruce beetle have not been a problem in recent years, the potential does exist for an outbreak to occur in both Douglas fir and Engelmann spruce. The risk should remain low unless there is extensive windthrow of these two species. Spruce budworm is presently not a problem. However, this area was heavily infested in the early 1950's and 1960's. Destructive populations could rebuild. Should an insect epidemic occur, mortality would compound fire potential conditions.

SOCIAL / ECONOMIC ENVIRONMENT

The Middle Fork Judith Wilderness Study Area is located in Judith Basin County. Like most of the area-of-influence, Judith Basin County is heavily dependent on farming and ranching. It has a stable population, which is projected to have a slight decline over the next 20 years.

The Middle Fork Judith is within a day's drive of the population centers of Great Falls, Lewistown, Helena, and Billings. It is also close to local wood processing plants, especially White Sulphur Springs which is about 30 miles to the southeast. Local ranchers graze cattle and sheep in the area during the summer-fall months.

Recreational users of the study area generally come from the surrounding local area. In the hunting season the study area attracts users from a wider area such as Great Falls, Lewistown, and out of state.

SOCIAL VARIABLES

A vital component of the social base line data is the social variables or social traits of a community that can be measured and are judged to be potentially affected by activities of the Forest. Three variables have been selected as important indicators of effect on local communities. These social variables are:

Sense of Control / Self Sufficiency

-- The feeling that one has control over one's life direction; not subject to control by people outside the community.

Symbolic Meaning

-- The emotional and rational attachment one has on places and things on or from the Forest.

Emotional / Spiritual Renewal

-- The revival or reestablishment of certain emotional and/or spiritual levels as related to wildlands; a state of mind characterized by calmness, quietness, and tranquility; escape from excessive stimuli.

GENERAL DESCRIPTION

The 12 by 8 mile Big Snowies Wilderness Study Area is within Fergus and Golden Valley Counties. The study area is nearly all federal land except for 100 acres of private land. The study area is managed by the Lewis and Clark National Forest. The Crystal Lake area (approximately 10,000 acres) was not included in the study area because of developments, including two trailheads, a boat ramp, a picnic area, a campground, a cabin, and a paved road. National Forest lands south and northeast of the study area also contain development. Private land surrounds the study area are nearly all side.

In the study area, limestone reefs abruptly thrust upward to elevations over 8,600 feet from the surrounding plains (5,000 feet). The Big Snowies were formed from uplifted tilted limestone beds. Round basins were weathered away in the limestone resembling cirque basins created by glaciers, giving the area unique geologic features. The tops of the mountains are flat in many places. Slopes range from bare, rocky steep slopes to forested gentler slopes to the southeast.

South of the study area is the Twin Coulee Unit administered by the BLM (Bureau of Land Management). This 6,870 acre, heavily timbered, unroaded area is being studied by BLM for wilderness classification. As planning began, the agencies intended to use a cooperative interagency planning effort, but the BLM later determined that the Twin Coulee area might have a greater mineral potential than earlier thought. Needing more time and also support from the U.S. Geological Survey to determine the mineral potential, the BLM decided to include the wilderness study of the Twin Coulee Unit as part of th Billings Resource Management Plan, scheduled to be completed in 1983.

RECREATION

Dispersed Recreation

Recreation use in the Big Snowies area is dispersed. Day hiking, backpacking, hunting, and trailbike riding are the most popular activities. Annual non-motorized recreation use is about 4,000 RVDs. Lack of water, especially along the crest, is the limiting factor to extended backpacking trips. No designated campsites or facilities exist. The Crystal Lake area provides the only developed campground adjacent to the study area.

Trails

Eighty miles of maintained trails provide access to key features. These are primarily hiker and horse trails; however, some motorcycles do enter the area. The majority of trails are closed to motor vehicles. Access through private land is extremely limited.

The Halfmoon and Swimming Woman trails have been nominated for inclusion in the NeeMePoo National Recreation Trail which commemorates the route taken by Nez Perce Indians in their flight toward Canada.

Motorized Recreation

In addition to the trails, there are 14 miles of primitive roads used by 4-wheel drive vehicles and 36 miles of low standard roads usable by 2-wheel drive pickups. Almost every stream bottom on the periphery has some low standard road which penetrates into the study area for varying distances. Annual motorized recreation use is 1,700 RVDs, or about 30 percent of the use.

Special Areas

Principal attractions in the study area include caves such as Ice Cave and Devil's Chute. Several unexplored caves are known to exist along with possibilities of others in the limestone formations. Fossil hunting is popular and extensive old lake deposits on the uplifted plateaus yield excellent specimens.

Scenic Beauty

The alpine and tundra vegetation on the crest and canyon wall, along with unique rock formations and cliffs, are scenic attractions. Unobstructed views of surrounding plains, agriculture lands, and distant mountain ranges present opportunities for pleasure viewing and photography. On clear days it is possible to see mountain ranges up to 100 miles away.

WILDERNESS

Wilderness Character

The vast majority of National Forest System lands in the Big Snowy Mountains shows little evidence of use by humans. The study area boundary excludes most major developments. The study area is a rectangular parcel of some 150 square miles. Surrounded by private land, the area offers scenic vistas of much of central Montana including seven different mountain ranges, some over 100 miles away. Opportunities for solitude and primitive recreation pursuits are high, though core-to-perimeter distances rarely exceed 4 miles. User feelings of isolation are common when traveling up the narrow drainages and individuals on the crest experience a "top of the world" sensation.

Apparent Naturalness

Impacts on apparent naturalness and natural integrity are confined to three principal geographic areas. The first area is made up of the Blake Creek, Timber Creek, Careless Creek, and Swimming Woman Creek drainages where timber harvest has occurred. Included are five clearcut units and about 5 miles of low standard road associated with timber harvest activities. These areas were harvested in the 1960's and have since been reforested. The road still accommodates motorized use. Several old mine shafts are located in the Swimming Woman Creek and Careless Creek drainages. These impacts are readily apparent.

The second area is an electronics site located on West Peak which includes several buildings, antennas, generators, and radio equipment. The site is less than an acre in size. The electronics site is visible from several locations along the western third of the study area.

The third area is a small area in Greenpole Canyon in which timber was harvested in the early 1960's. The area includes about one mile of low standard roads. The harvested lands have been reforested. The roads associated with the harvest are still being used. These impacts are readily apparent.

WILDLIFE AND FISH

Major big game species in the Big Snowies are mule deer, black bear, and mountain goat. Elk numbers have been increasing gradually in the northern portion of the range and now provide some limited hunting. White-tailed deer inhabit some of the lower elevation lands.

T & E Species

Bald eagles, an endangered species, are known to use the area during spring and fall migrations. The only other endangered species possibly using the area is the peregrine falcon. No recorded observations of this species have been made in recent years and no suitable unoccupied habitat has been identified.

Small Game Species

Small game species in the area include blue grouse and ruffed grouse. A few flocks of Merriam's turkey are found in the southern portion of the area. Numerous non-game species in the Big Snowies include mountain lion, coyote, bobcat, golden eagle, and prairie falcon.

Wildlife Habitatt

Opportunities are available for habitat improvement to enhance spring/fall ranges for deer and elk. Early successional stages in the extensive burned over areas in the southern portion of the Big Snowies could be maintained by prescribed burning or other methods of conifer regeneration suppression.

Fish Habitat

Fishable streams are few. Most streams are intermittent and too steep to support fisheries. Halfmoon, Cottonwood, and Swimming Woman Creeks provide, in total, about 10 miles of cutthroat fisheries. Fish rarely exceed "pan size."

RANGE

Grazing

Twelve permittees have grazing permits for 867 cattle and 900 sheep annually. They graze a total of 2,700 AUMs yearly. There are 20 miles of fence and 20 spring developments on National Forest lands in the Big Snowies. Not all of these are within the study area, but because of the nature of livestock operations, they form an integral part of the management of the total area.

Opportunities

The study area could provide an additional 900 AUMs of domestic grazing. Increases are dependent on water developments and investments in fences. Water development is the limiting factor in realizing any livestock increase within the area. Up to 10 water developments and 5 to 10 miles of fence would be required to accomplish these increases.

TIMBER

Commercial Forest

Approximately 50,000 acres or 51 percent of the study area is classified as commercial forest. Productivity is less than average for the Forest and below average for eastern Montana. Lodgepole pine and Douglas fir are the principal species. Most of the lodgepole pine stands are pole size, whereas the Douglas fir stands are sawlog size.

Most of the commercial forest is located in the canyon bottoms and western slopes. The lack of access into these areas and distance to the market are the greatest limitations to timber harvest. Right-of-way presents a problem because the Big Snowies is almost completely surrounded by private property. Steep slopes, cliffs, and marginal timber sites have precluded harvesting in other areas.

Timber Sales

No sales have been programmed within the study area since the area was put in wilderness study area status.

Firewood

Current use for firewood is low because of limited access. Most of the trees are relatively young and small with no extensive areas of easy to reach firewood. Future firewood use would be relatively low because other forest areas provide better gathering areas on more gentle ground.

SOILS AND WATER

Soils & Water Quality

Most watersheds are in good condition. The Big Snowies basins were formed by slumping at the head of larger drainages and are generally sensitive to soil disturbing activities. Other parts of the drainage are stable. Streams on the north drain into the Judith River and those on the south drain into the Musselshell River. Downstream use is primarily for irrigation. No significant fisheries or domestic use are involved. Therefore, the current and expected future use is relatively insensitive to water quality. With the exception of short periods of spring runoff, no streams on the northside of the study area provide irrigation water. Most of these streams supply underground aquifers for wells in the valleys. On the south side several streams remain live year round and provide irrigation in all but the driest years.

Climate

The average annual precipitation in the study area varies from 20 inches at 5,000 feet to 55 inches at 8,600 feet. The majority of the high elevation precipitation is in the form of snow.

Water Storage

There are no known water storage projects planned in the study area and the potential for such projects is low or non-existent.

MINERALS

Geology

The Big Snowy range is a broad arching structure of sedimentary rock whose axis runs east and west. Layers of limestone, sandstone, and shale originated millions of years ago in a shallow inland sea. Folding and warping has resulted in an asymmetrical formation that is gently inclined on the north with a steep southern flank. Water and stream forming processes have eroded weaker underlying shales causing large landslides with the harder and more resistant limestone remaining. The resulting limestone cliffs now form the headwaters of most major streams in this range. These processes have given the Big Snowies their characteristic form - a wide relatively flat crest with steep headwall and bowl shaped canyons draining into the adjacent plains.

Opportunities

The past and present mineral activity for base and precious metals has been minimal. Likewise, the potential for future activity also appears to be minimal. About 46,650 acres are under consideration for oil and gas leasing.

The fringes of the range may have a low potential for oil and gas accumulation. Currently there is oil and mineral exploration in the Heath Shale at the foot of the range. Even if energy resources were located, road construction and other constraints on operability would be the principal limitation on the extent of development. Oil shale exploration in the Heath formation will probably be confined to the foothill fringe and will not directly affect the study area. It is doubtful that any exploration would occur within the study area.

LANDS

Private Land

The study area includes 100 acres of private land located on the periphery of the study area. The study area and adjacent National Forest System lands are bounded by private land.

Special Use

An electronic site, located on West Park, provides communications for a variety of users. Because the topography of the study areas is much higher than the surrounding area, it provides several ideal electronic sites. The Forest has an application pending for a second electronic site. A buried water line is under special use permit in Halfmoon Canyon.

FACILITIES

Access

The study area contains 50 miles of low standard roads. Thirty-six miles can be negotiated with 2-wheel drive vehicles and fourteen miles require 4-wheel drive vehicles. There are 80 miles of fair to poor trails in the study area. Public access through surrounding private lands is an issue, as there are only two public entry points on the south and one on the north of the Big Snowies.

Energy Corridors

No need is apparent for other facilities such as power transmission lines. Valleys to the east and west are more suitable for this use.

PROTECTION

Fire

All fires are suppressed as quickly as possible. As a result, there is a high occurrence of natural fuels. Fuel build-up varies from a low of 10 tons per acre to a high of 60 tons per acre. During extreme fire conditions a start could result in a major fire. Access is limited and potential for a major burn is great.

Insect & Disease

Currently there are no epidemic insect problems. Some epidemic mountain pine beetle infestation exists on adjacent lands particularly to the east in the Little Snowy. Infestation is expected to occur within 5-10 years in the lodgepole and ponderosa pine.

Other pests include Douglas fir beetle, spruce beetle, western balsam bark beetle, and spruce budworm. None of these are current threats and no major outbreaks are expected.

SOCIAL / ECONOMIC ENVIRONMENT

The Big Snowies Wilderness Study Area is located in Fergus and Golden Valley counties. These counties are also heavily dependent on farming and ranching, although Lewistown is a small service center for central Montana. Golden Valley County is projected to have a slight decrease in population over the next 20 years while Fergus County is projected to have a slight increase.

The Big Snowies is within a day's drive of the population centers of Great Falls, Lewistown, and Billings. It is within a reasonable distance of local wood processing plants, especially Judith Gap which is about 15 miles to the west. Local ranchers graze cattle in the area during the summer and fall months.

Recreational users of the study area generally come from the local area, especially Lewistown. During the hunter season the study area attracts users from a wider area, such as Great Falls and Billings.

SOCIAL VARIABLES

A vital component of the social base line data is the social variables or social traits of a community that can be measured and are judged to be potentially affected by activities of the Forest. Three variables have been selected as important indicators of effect on local communities. These social variables are:

Sense of Control / Self Sufficiency

-- The feeling that one has control over one's life direction; not subject to control by people outside the community.

Symbolic Meaning

-- The emotional and rational attachment one has on places and things on or from the Forest.

Emotional / Spiritual Renewal

-- The revival or reestablishment of certain emotional and/or spiritual levels as related to wildlands; a state of mind characterized by calmness, quietness, and tranquility; escape from excessive stimuli.

DEIS
SECTION 2
MONTANA WILDERNESS STUDY ACT AREAS

CHAPTER IV
ENVIRONMENTAL CONSEQUENCES

Overview

This chapter describes the major environmental consequences of implementing the Preferred Alternative and other alternatives considered in detail. This chapter is the scientific and analytic basis for the comparison of the alternatives described in Chapter II. Environmental consequences are the result of activities scheduled to implement an alternative. The amount of activity varies by alternative and thus establishes the level of environmental effects. The alternatives include standards and guidelines designed to protect the long term productivity of the lands.

The effects discussed may be beneficial or adverse, direct or indirect, short term or long term, and reversible or irreversible. Direct environmental effects occur at the same time and place as the initial action, whereas indirect effects occur later in time or are removed in distance from the action, but are still reasonably foreseeable. Also, any conflicts with plans of other Federal and State agencies, and State and local governments are discussed.

This chapter summarizes the overall consequences of each alternative and then the activities and associated consequences of the alternatives are discussed in more detail in terms of resource elements (e.g. range, wildlife, timber). Any mitigation measures are also discussed. Tables M4.1 and M4.2 display some of the outputs and physical, biological, social, and economic effects of the alternatives considered in detail. They are referenced throughout the chapter.

The first portion of this chapter deals with the Middle Fork Judith; the second portion with the Big Snowies.

NON-SIGNIFICANT FACTORS

The following factors of the environment would be affected the same under any alternative in this environmental impact statement for both the Middle Fork Judith and Big Snowies areas:

Cultural Resources
Cultural resources are protected equally under all alternatives.

Prime Farmlands
No prime farmlands are affected under any of the alternatives.

Wetlands
Wetlands are protected equally under all alternatives.

Minority, Economically Depressed, Elderly, Handicapped, Youth Groups, and Non-traditional Groups
These groups received equal treatment and consideration under all alternatives.

Bald Eagle
While bald eagles are commonly observed on various portions of the study areas during fall and spring mitigations, no active bald eagle nests are known on the study areas. None of the alternatives significantly affect this species.

Peregrine Falcon
Peregrine falcon are rarely observed on or near the study areas during seasonal mitigations. No known active or historic nesting sites exist on the study areas. None of the alternatives will significantly affect this species.

Other factors or uses on the study areas which will not significantly affect any environments of the study areas or the surrounding areas are:

Human Resource Programs
Human resource programs are the same under all alternatives and under current direction. Therefore, no human resource program has a significant effect on any of the environments.

Land Line Location
The Forest has an ongoing land line location program; however, the program does not have a significant effect on any of the environments.

Land Status
Land status activities do not have a significant effect on any of the environments.

MIDDLE FORK JUDITH

SUMMARY OF EFFECTS

Alternative 1

Alternative 1 would manage the Middle Fork Judith Wilderness Study Area to maintain the existing semi-primitive recreation opportunities and elk security habitat. Direct effects would be a loss of primitive recreation (wilderness) and timber management opportunities.

Alternative 2

Alternative 2 would recommend the Middle Fork Judith Wilderness Study Area for wilderness classification. Direct effects would be a loss of semi-primitive motorized recreation and timber management opportunities.

Alternative 3

Alternative 3 would manage the Middle Fork Judith Wilderness Study Area for a high level of commodity products. Employment and income increase the most under Alternative 3. Direct effects would be a loss of most acres of semi-primitive recreation opportunities and elk security habitat.

Alternative 4

Alternative 4 would manage the Middle Fork Judith Wilderness Study Area for a moderate level of commodity products. Employment and income would increase significantly. This alternative would provide 8,320 acres of semi-primitive recreation opportunities. Direct effects would be the loss of other semi-primitive recreation opportunities and elk security habitat.

Alternative 5

Alternative 5 would manage the Middle Fork Judith Wilderness Study Area for a low level of commodity products. Employment and income would increase slightly. Direct effects would be a loss of semi-primitive recreation opportunities and elk security habitat on 38,240 acres.

Alternative 6
Preferred

Alternative 6 would manage 24,160 acres for commodities and 67,840 acres for semi-primitive recreation. Employment and income would increase slightly. Direct effect would be the loss of semi-primitive recreation opportunities and elk security habitat on 24,160 acres.

Table M4.1 displays some of the outputs and physical, biological, social, and economic effects of the alternatives considered in detail.

TABLE M4.1

RESOURCE PRODUCTION AND EFFECTS BY ALTERNATIVE

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	(Preferred) ALT 6
CHANGE IN RECREATION SETTING BY 2030							
- Primitive (Wilderness)	Thousand Acres	0	+92	0	0	0	0
- Semi-Primitive	Thousand Acres	0	-92	-92	-84	-38	-24
- Roaded Natural Appearing	Thousand Acres	0	0	+92	+84	+38	+24
VISUAL QUALITY OBJECTIVES							
- Preservation	Thousand Acres	0	92	0	0	0	0
- Partial Retention	Thousand Acres	92	0	0	8	54	68
- Modification	Thousand Acres	0	0	92	84	38	24
WILDLIFE							
- Wildlife Habitat Improvement	Acre Equivalents						
-1982-1990		30	0	70	30	30	70
-2021-2030		30	0	100	30	30	70
- Elk Population Potential 1/							
-1982-1990	Number	1200	1200	1200	1200	1200	1200
-2021-2030		1300	1160	1130	1150	1100	1180
- Catchable Trout	Number						
-1982-1990		5250	5250	5250	5250	5250	5250
-2021-2030		5250	5250	4500	4830	4410	4950
- Total Land Harvested in Undeveloped Areas by 2030	Acres						
-Nonwinter range		0	0	31890	29690	6490	3090
-Winter range		0	0	510	510	510	0
- Average Annual Prescribed Burning for Wildlife Habitat Improvement	Acres	10	0	40	10	10	30
- Elk Hunter Recreation							
-1982-1990	Hunter Days	8000	8000	7100	7700	7800	8000
-2021-2030		8000	8000	4500	4300	7200	7300
RANGE							
1982-1990	AUMs	900	900	900	900	900	900
2021-2030		900	900	980	980	940	940

1/ Estimate of maximum number of elk that would use the area a portion of the year.

TABLE M4.1

RESOURCE PRODUCTION AND EFFECTS BY ALTERNATIVE

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	(Preferred) ALT 6
TIMBER							
- Programmed Sales Offered	Million Board Ft.						
-1982-1990		0	0	10.6	3.9	3.5	0
-1991-2010		0	0	0	6.0	0	1.1
-2001-2010		0	0	7.8	12.1	2.3	1.1
-2011-2020		0	0	7.2	.5	0	.5
-2021-2030		0	0	2.7	4.5	0.3	.5
- Acres Harvested	Acres						
-1982-1990		0	0	1,270	440	400	0
-1991-2000				0	670	0	120
-2001-2010				870	1350	260	120
-2011-2020				800	60	0	60
-2021-2030		0	0	300	500	40	60
- Acres Available, Capable, Suitable	Thousand Acres	0	0	52.5	50.2	5.9	13.3
MINERALS							
- Land Available for Oil and Gas Occupancy Leasing	Thousand Acres	4.2	0	4.2	4.2	4.2	4.2
LANDS							
- Lands Required for Right-of-Way	Miles	0	0	5.6	5.6	5.6	5.6
FACILITIES							
- Disturbance from Roading	Acres						
Arterial and Collector							
-1982-1990		0	0	6.3	4.2	4.2	0
-1991-2000		0	0	0	4.2	0	4.2
-2001-2010		0	0	1.4	1.4	2.1	2.1
-2011-2020		0	0	4.2	0	0	1.4
-2021-2030		0	0	0	0	1.4	0
Local							
-1982-1990		0	0	65	20	20	0
-1991-2000		0	0	0	28	0	5
-2001-2010		0	0	45	70	15	5
-2011-2020		0	0	40	5	0	5
-2021-2030		0	0	15	35	5	5
SOCIAL/ECONOMIC							
- Change in Employment							
1982-1990	Person Years	0	0	140	50	45	0
2021-2030		0	0	35	60	5	5
- Change in Income							
1982-1990	Thousand Dollars	0	0	1990	730	660	0
2021-2030		0	0	510	840	60	90
- Change in Population	People						
1982-1990		0	0	322	115	103	0
2021-2030		0	0	80	138	12	12
- Change in Sense of Control/Self-Sufficiency	Index*						
-Less Development		+3	+3	-3	-3	-2	-1
-Nonwilderness		-2	-3	+3	+3	+2	+2
-Wilderness		-1	+3	-3	-3	-2	-1
-Timber		-2	-3	+3	+2	+1	+1
- Change in Symbolic Meaning	Index*						
-Economic Maximum		-3	-3	+3	+2	+2	+2
-Nature/Refuge		+2	+3	-3	-3	-2	-1
- Change in Emotional/ Spiritual Renewal	Index*						
- Human Activity		0	+3	-3	-2	-1	-1

* Factors which reduce the expression of these social variables are shown with a (-) and factors which heighten the expression of these variables are shown with a (+). The numbers 1, 2, and 3 are a relative ranking; 1 is the least and 3 is the most. Factors which are neutral are represented by a (0). A discussion of these social variables is given on pg. 3-28.

DISPERSED RECREATION

The Dispersed Recreation Program essentially maintains an environment for outdoor recreation opportunities. Specific activities include posting signs, clean-up, visitor information services, and patrolling for public safety.

Table M4.1 summarizes the changes in recreation setting over 50 years. Dispersed recreation opportunities occur on primitive, semi-primitive, and roaded natural appearing land areas.

Recreation

Alternative 1 maintains a semi-primitive recreation setting. Alternative 2 would give the area wilderness classification that would prohibit existing local motorized recreation use. Alternative 3 would change the recreation setting on the entire 92,000 acres from a semi-primitive to a roaded natural appearing setting. Alternative 4 is similar to 3, except 8,320 acres would remain in a semi-primitive recreation setting. Alternative 5 would change the recreation setting on 38,240 acres from a semi-primitive to a roaded natural appearing setting.

The Preferred Alternative (6) would change the recreation setting on 24,160 acres from a semi-primitive to a roaded natural appearing setting. The remaining 67,840 acres would not be affected.

Timber

No timber harvest would occur under Alternatives 1 and 2. Alternative 3 would offer the largest amount of timber for harvest, and Alternatives 4, 5, and 6 (Preferred), in that order, would offer less timber harvest.

Protection

Because recreation use levels are expected to increase over time, the number of person-caused fires would also increase. This adverse effect would be the same for all alternatives.

VISUAL RESOURCE

The Visual Resource Program determines the degree to which the natural landscape may be modified in its appearance by various activities such as timber harvest and mining. Categories or objectives are preservation, retention, partial retention, and modification of the natural landscape. Objectives are determined in part by how visible areas are from population centers, major highways, roads, trails, campgrounds, and other recreation developments. Table M4.1 shows the amount of acres within each visual quality objective.

The study area's remoteness, rolling topography and varied landscape combine to lessen the affects of resource activities on the visual resource. The lower, limestone canyons are more sensitive to visual impacts.

Visual Quality

The natural landscape would be preserved under Alternative 2 although Alternative 1 retains the landscape much as it presently exists. The modification of the landscape would occur under Alternatives 3, 4, 5, and 6 (Preferred). Short term impacts from timber harvest and roads could be mitigated by scheduling treatments which would be spaced and timed so that adverse visual impacts are minimized. Alternative 3 would impact the visual resources of the lower Middle Fork Canyon.

Social and Economic

Alternatives 3 and 4 harvest more timber in visual sensitive zones. Thus, the costs to harvest the timber are greater due to special road standards and added care required in logging.

WILDERNESS

The Wilderness Program provides for protection and preservation of large areas in their natural state. Primitive recreation takes place within classified wilderness and this opportunity can be maintained with no additional impacts on the environment.

Table M4.1 shows comparison of the acres in wilderness for each alternative. Alternative 2 is the only alternative with recommended wilderness and thus, the only alternative affected by the Wilderness Management Program.

Recreation

Recommended wilderness under Alternative 2 would shift the semi-primitive recreation opportunity to primitive recreation, although these opportunities are below average when compared to other areas of the Little Belts. Under wilderness classification, the area would be closed to motorized recreation. This would be a loss of 10,000 RVDs per year.

Soils & Water

Alternative 2 with wilderness classification would protect the watershed of the Middle Fork Judith and the adjacent soils from resource activities. The study area does not fill a target for ecosystem or wilderness associated wildlife species representation.

Diversity

Vegetative diversity may decrease. Natural diversity is high in the study area although both climax timber and grassland species are present. Management fire in wilderness would be used as a natural method of vegetation management and maintaining diversity.

Protection

Under wilderness classification (Alternative 2), the risk of mountain pine beetle and western spruce budworm infestations reaching epidemic levels would increase significantly. Currently much of the timber resource is mature or overmature lodgepole pine which would be susceptible to the insects. The potential for Douglas fir beetle and spruce beetle infestations would increase over the planning period since timber harvest would not be possible to remove susceptible stands.

Air Quality

Management fire in wilderness (Alternative 2) may adversely affect air quality, visibility, and odor throughout the local area.

Social and Economic

Access for mineral activities would be subject to restrictions under wilderness and could increase the costs to miners. Mineral potential is high in the Middle Fork Judith.

Timber harvesting opportunities, averaging 3.8 million board feet per year, would be foregone in the study area under Alternative 2. In order to maintain the Forest's harvest level, areas outside of wilderness would need to be more intensively managed.

An increase of visitors to the study area due to the wilderness classification could help the local economy, outfitters, and other recreation-related businesses.

The social variable of sense of control and self sufficiency would be affected by the wilderness designation of the study areas. Those people who do not want wilderness designations would feel a loss of control by Alternative 2, and increased control in the other alternatives. The same alternatives would create the opposite feelings for those people wanting wilderness designation.

Social benefits in wilderness classification under Alternative 2 would exist, especially for people who enjoy non-motorized use. People recognize intrinsic benefits to having a pristine environment nearby, such as being able to "get away from it all", having plants and animals in their natural state of observation, hunting, fishing, backpacking, and hiking in an environment without the impacts of man, and having the knowledge that an undeveloped area is nearby. Wilderness classification would help improve the distribution of wilderness in Montana.

Wilderness designation would result in the area being managed in such a manner as to leave it unimpaired for future generations use and enjoyment. It would provide valuable opportunities for research and study of natural life processes which are largely undisturbed by man.

OTHER ALTERNATIVE

Alternative 1, 3, 4, 5, and 6 (Preferred) forego the opportunity for wilderness classification at this time. Alternative 1 would retain the opportunity for future wilderness classification on all 92,000 acres. Alternative 4 would retain the opportunity for future wilderness classification on 8,320 acres, Alternative 5 on 53,760 acres, and Alternative 6 (Preferred) on 67,840 acres.

WILDLIFE AND FISH

Wildlife and fish management is the maintenance and improvement of wildlife and fish habitat. Activities include vegetation management for increasing the amount of shrubs, forbs, and grass available to various species as well as protecting some sites as they exist for species depending upon an "old growth" environment. Maintaining security cover for some animals and minimizing the disturbances of human activity in calving areas, migration routes, and T&E species habitat are also objectives. Activities in fisheries management include minimizing sediment in streams, fish structure maintenance, and channel stabilization.

Table M4.1 lists acres of wildlife habitat improvement. Elk and catchable trout populations are reported to reflect habitat capacity.

All alternatives except Alternative 2 (wilderness) have wildlife and fish habitat programs, although the management activities for Alternatives 3 and 4 are primarily done to mitigate some of the adverse effects from other resource activities such as roading and timber harvesting.

Alternative 1 has the most beneficial effect on the elk populations whereas other alternatives reduce populations by 20 to 100 animals. The Judith elk herd has state significance and is a large contributor to the quality elk hunting opportunity in the Little Belt Mountains. Increase in domestic grazing on elk winter range contributes to the adverse effect on the population.

Alternatives 1 and 2 would maintain catchable trout populations. All other alternatives would reduce the population by 300 to 840 fish. This decrease would be due to increases in grazing in raparian zones.

Recreation

Alternative 1 would increase recreation opportunities for viewing and hunting because of the increased big game populations. Alternative 2 would maintain these opportunities. Alternatives 3 and 5, even though they have intensive wildlife habitat programs, show a decrease in elk hunter recreation. Most efforts in wildlife management in these alternatives are directed toward mitigation of timber and grazing activities. Table M4.1 shows elk hunter recreation by alternative.

Social and Economic

The wildlife and fish management program has both beneficial and adverse effects upon the economy of the State and surrounding communities. Favorable economic effects of intensive wildlife management would be an increase in recreation opportunity, visitors to the area, and thus, an indirect effect of increasing income to the local economies.

Wildlife habitat programs can have an adverse economic impact on timber harvesting, ranching, and mineral activities. The cost of doing business can increase as specific measures and structures are needed to mitigate adverse effects on big game populations, and other wildlife and fish.

Under Alternatives 3, 4, 5, and 6 (Preferred), range and big game values would often be in conflict. Most winter range on the Forest is also primary grazing land for domestic livestock. If domestic grazing would increase on winter ranges, special fencing, and/or intensive grazing management systems would be needed to maintain wildlife forage at a high level. Again, the effect of an intensive wildlife habitat program would be to increase the cost of grazing to ranchers. Elk that summer in the Middle Fork Judith are highly dependent on private, state, and other Federal land for winter habitat. The Judith River State Game Range provide much of this winter habitat. Degradation of hay stacks on adjacent private land may occur if the big game population is too high and/or a severe winter occurs requiring big game to move off the Forest or game range in search of food.

The social effects of an intensive wildlife habitat program are favorable. People usually agree that an active wildlife program is a "good thing" unless the management directly impacts their livelihood. Alternative 1 provides for the highest level of quality wildlife habitat. Under this alternative enjoyment of wildlife would be at the highest level whether through hunting, fishing, photography, or observation. The social benefits from wildlife can be expected to be less with Alternatives 3, 4, 5, and 6 (Preferred) because wildlife habitat and population generally remain at the same level or decrease.

RANGE

The Range Management Program provides for efficient livestock grazing on forest and rangelands commensurate with other needs. Activities include management of range permits, monitoring range use, and maintaining and constructing range improvements, such as fences and water developments.

Table M4.1 shows the acres grazed by domestic livestock for each alternative.

Soils & Water

All alternatives except for Alternative 1 and Alternative 2 increase grazing over a 50-year period. Increase in sedimentation and a decrease in water quality could occur. Mitigation measures are listed in the management practices, standards, and guidelines for grazing in riparian zones. Proper distribution of livestock would be achieved through the placement of salt and construction of fences.

Range

Burning to change the vegetation to seral stage would have a long term benefit for the range resource by maintaining a high level of forage production. Alternatives 3, 5, and 6 (Preferred) burn the most acres by prescription for range management.

Construction of fences and water developments improve the distribution of livestock, provide additional grazing use, reduce overused areas, and improve the vigor and production of forage.

Wildlife & Fish

Livestock grazing has an adverse effect on big game; primarily where grazing occurs on big game winter ranges.

Elk population decrease under Alternatives 3, 4, 5, and 6 (Preferred Alternative) which provide for small increases in AUMs for livestock. The increases in AUMs would occur on both winter and summer big game range. Competition between livestock and elk could have an adverse effect on elk on summer ranges. The opportunity to effectively mitigate adverse impacts upon big game becomes less as domestic livestock allocations increase.

Alternative 1 and Alternative 2 maintain the catchable trout population, but other alternatives result in a 300 to 840 trout decrease over 50 years due to increased grazing in riparian zones.

Social and Economic

All alternatives except Alternatives1 and 2 increase livestock grazing to provide more beef, lamb, and wool to the consumer. This would generate relatively small increases in income to the local level industry and increase grazing receipts to the U.S. Treasury. Alternative 3 increases grazing by 9 percent over the current level.

An increase in grazing opportunity over time for all alternatives except Alternatives 1 and 2 has a beneficial effect upon the ranching operations by assuring a constant supply of land for grazing. The feeling of certainty for ranchers about future supply would be the greatest under Alternatives 3 and 4.

Some impacts of grazing include conflicts with recreationists, especially in favorite fishing or camping spots. Mitigation measures would exclude livestock from areas during heavy recreation use.

TIMBER

The Timber Management Program ensures the growth and use of the timber resource for the benefit of the Nation. Activities include the scheduling of timber harvest, administration of timber sales, timber stand improvements such as thinning, and the reforestation of harvest sites through site preparation and planting. Road construction and maintenance, an activity closely associated with timber harvest, is discussed later in the chapter under Facilities. Table M4.1 gives the harvest volumes, the acres harvested, and acres available, capable, and suitable for timber management.

The Preferred Alternative (6) would harvest about 32 million board feet of timber in the upper Middle Fork over the 50-year planning period. In terms of the overall Timber Management Program for the Forest, this volume is not significant. However, the Preferred Alternative does program timber harvest on those areas where the investment in roads is commensurate with the value to be removed.

The Preferred Alternative (6) does not program any regulated timber harvest in the Lost Fork, or the lower Middle Fork of the Judith. An additional 251 million board would be available during the 50-year planning period if this area was fully developed (Alternative 3). This would take a high investment in roads to access these areas. The failure to harvest timber periodically is an irretrievable loss of products. Alternative 4 would harvest 270 million board feet and Alternative 5, 60 million board feet.

Alternative 1 does not program any regulated timber harvest in the study area. Wilderness classification (Alternative 2) would prohibit harvesting timber except for wilderness or mineral purposes.

Soils & Water

Water yield from Alternatives 3 and 4 is less than a 2 percent increase per decade. This change is less than the annual variation in water yield due to natural factors. These alternatives would also have the highest levels of sedimentation. Mitigation measures to prevent soil erosion from timber harvest would include directional felling of trees, waterbarring on skid trails, and seeding landings.

Recreation

Alternatives 3, 4, and 5 would develop the most land for motorized use. The Preferred Alternative (6) would maintain a large area in a semi-primitive setting.

Favorable social effects of increased roading include increased opportunity for recreationists who enjoy motorized use, although this would depend on the road management for the area. Timber harvest would adversely affect those people who enjoy an unroaded recreation setting and a natural landscape.

Air Quality

Air quality would be affected a few days during the fall and spring as a result of prescribed fires for the disposal of activity fuels and composition and stocking control under Alternatives 3, 4, 5, and the Preferred Alternative (6). See Table M4.1.

Visual Quality

Timber management activities have significant effects on visual quality. Although the impacts of timber management are generally short term, the immediate change to the existing landscape is undesirable to many Forest visitors. The establishment of visual quality objectives provides the method for carrying out timber management and other activities while protecting the visual resource. Treatments would be spaced and timed so that adverse visual impacts are minimized. Alternatives 3 and 4 would have the greatest potential for disruption of the visual resource.

Wildlife & Fish

Timber harvest provides wildlife forage and habitat diversity by creating different age classes of trees. Timber harvesting reduces hiding and thermal cover primarily impacting big game fall ranges. The Preferred Alternative (6) would effect big game security habitat on 24,160 acres in the Middle Fork Judith Study Area. Alternatives 3, 4, and 5 would affect security habitat on more acres.

Wildlife species associated with old growth could be adversely affected under Alternatives 3, 4, 5, and 6. Less acres would be maintained as old growth which would decrease habitat available for these species. Habitat for wildlife species using the grass/forb stage would increase under these alternatives. Human use, equipment operation, and other noises associated with timber harvesting activities could have a short term effect on the distribution of wildlife.

Fish populations could be adversely affected by increased sedimentation levels in the streams from timber harvesting. Mitigation measures are listed in the management practices, standards, and guidelines for timber harvest.

Range

Timber management is the greatest contributer to habitat modification. Additional forage for wildlife and domestic livestock can be created through timber harvesting. Alternatives 3, 4, 5, and 6 (Preferred) would increase transitory range for domestic livestock.

Protection

Timber harvesting would be used to control insects and disease, particularly in Alternatives 3 and 4. Under these alternatives, the Forest would be less susceptible to mountain pine beetle attacks since more acres are in a variety of age classes created through timber management activities. Alternatives 1 and 2 provide for the least protection from mountain pine beetle infestation.

Accumulation of fuels results from timber harvesting and increases the risk of forest fires. This effect would be mitigated under all alternatives by piling and burning of the slash.

Social and Economic

Increases in the level of timber harvest would help meet the demand for wood products and help stabilize timber dependent communities. The Preferred Alternative (6) would provide a modest increase in the Forest's Timber Sale Program. Alternatives 3, 4, 5, and 6 (Preferred) would increase employment, personal income, and county and Federal receipts.

Timber harvesting in the Middle Fork Judith Study Area would affect employment and population in the Monarch-Neihart and White Sulphur Springs communities.

The economic benefits generated under Alternatives 3, 4, 5, and 6 (Preferred) would help to increase the sense of control, self sufficiency, and cohesion within timber dependent communities such as White Sulphur Springs by producing a more optimistic economic outlook which could increase community spirit. Alternatives that increase harvesting would help relieve the uncertainty for the timber industry.

Monarch-Neihart communities are occupied or used by loggers, miners, recreationists, summer home residents, retired residents, and businessmen. Because of diverse values and expectations, differences of opinion on issues affecting the Forest would occur.

MINERALS
OIL AND GAS

The Minerals Program administers mineral exploration and development on National Forest System lands compatible with other resource values. Oil and gas exploration and development is carried out by private companies under a land leasing program. The BLM (Bureau of Land Management) is responsible for oil and gas leasing. The Forest Service reviews lease applications and recommends to the BLM what National Forest lands should be leased and what controls (stipulations) are needed to protect surface values and uses.

Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling for any given lease block (a collection of leases held by one company).

The Middle Fork Judith Study Area is considered low in gas and oil potential. However one company has made application for leasing acres within the study area.

Alternatives 3 and 4 would maximize the opportunity for exploration and development of potential gas and oil reserves. They would also have the greatest effect on the environment as described in this section. Alternatives 1, 5, and 6 (Preferred) would provide less opportunity for oil and gas exploration and development because semi-primitive recreation area would be protected by recommending leases with stipulations for limited surface use and timing restrictions.

Alternative 2 (wilderness) would be the most restrictive by recommending leases with stipulations for no surface occupancy, limited surface use, and timing restrictions.

Soils & Water

Soil productivity may be adversely affected by off-road vehicle travel. This can be avoided by limiting off-road travel to dry periods during the summer and fall and by avoiding compaction-prone soils.

The use of explosives in seismic surveys creates small holes or trenches in the soil. These areas should return to their original condition in a relatively short time; less than two years.

Construction of roads, drill pads, and other facilities would result in soil disturbance and would require measures to prevent erosion and increased sediment in streams.

Air Quality

The effects on air quality are generally short term. Dust from trucks and other equipment as they traverse the roads are a minor impact. A cloud of smoke and dust would dissipate into the air from each blast when explosives are used on the surface.

Vegetation

The method, type, and amount of explosive used would vary the amount of vegetative disturbance. Vegetation that is damaged by surface types of explosives would grow back in a relatively short period of time depending on the time of year, amount of moisture in the soil, and type of vegetation on the site. There would be little change in species composition. Drilling would disturb the vegetation and require some reclamation.

Construction of drill pads and roads would result in destruction of existing vegetation. The relatively small minor area disturbed by oil and gas activities should have little effect on native plant communities. Disturbed areas would be seeded with grass and native shrubs would be planted. Reforestation of reclaimed roads and drill pads would take place naturally.

Recreation

Oil and gas activities would affect the quality of the recreation setting. The effect would be particularly noticeable in semi-primitive settings where the introduction of roads and motorized use would be distracting. Some business operations, such as outfitters and guides, could be adversely affected by the disruption of the semi-primitive recreation setting by oil and gas activity. Traditionally used campsites would be protected by non-occupancy stipulations.

Noise from helicopters transporting personnel and moving of equipment would take place during any portable seismic activity. Also, when surface charges are detonated, the noise from the blast may be audible for several miles depending on the terrain and location of the operation.

User conflict on roads may take place between the general public, log hauling traffic, and oil and gas exploration traffic.

Visual Quality

Standards for pad site and road reclamation are designed to return the setting to a natural condition except that visual quality may be slightly lowered due to contrasting color and shape.

Wildlife

The timing and location of preliminary exploration and exploratory drilling activities in relation to key habitat use patterns would determine the significance of disturbances or displacement. The greatest potential conflict would be during use periods on restricted key habitat, such as big game concentration areas and migration routes. Direct mortality from seismic activity is very unlikely. Wildlife habitat loss or degradation would be negligible during preliminary exploration.

The sensitivity periods for big game are as follows:

Elk winter range	12/1 to 4/30
Elk calving areas	5/1 to 6/30
Elk migration routes	Designated by District Ranger
Mule deer winter range	12/1 to 4/30

Effects on wildlife would include possible destruction of habitat by road, drill pad, and other facility construction. The destruction of habitat could be significant if the habitat is important and limited.

Range

Human activity, blasting, and helicopter use may affect livestock habitat use patterns for short periods of time. Critical areas can be protected by non-surface occupancy stipulations.

Social and Economic

The preliminary exploration is usually performed by persons from outside the local area. Demand for services in the Monarch, Neihart, and Stanford communities would increase slightly during exploration.

Leasing National Forest lands for oil and gas exploration increases revenue to the Federal Treasury.

A discovery of oil and gas that would lead to production of oil or gas would have significant social and economic effects. Local community populations, employment, income, and community cohesion would change. Individuals lifestyles, job dependence, their sense of control, self sufficiency, and feelings of certainty and uncertainty would be affected.

METALLICS

The Minerals Program administers the mineral exploration and development on National Forest System lands compatible with other resource values. Exploration and development of metallic or hard rock minerals are carried out by private companies. Mineral prospecting and extraction normally occur on National Forest lands.

Metallic mineral exploration and development will occur under all alternatives. Alternatives 1 and 2 would be more restrictive on metallic mineral activities.

Soils & Water

The mineral potential is low for placer and dredging operations. A large operation would use about two or three acres and would affect soil and water in the local area. Soil disturbance would require restoration measures and special measures would be needed to prevent increased sedimentation in the local streams. Underground mining would create mine tailing disposal sites of 1 to 13 acres in size. Mitigation of these disposal sites would include site location away from live water, landscaping, and revegetation measures. Access roads and trails would be constructed under the Forest Management Practices, Standards, and Guidelines.

Wildlife and Fish

Small mammal and fish habitat could be eliminated in localized areas of placer and dredging operations. Revegetation measures would help reestablish these habitats.

Human activity and noise of mining operations would displace big game in the immediate area. Hauling of ore from underground mines would increase traffic and could increase big game road mortality along migration routes.

Visual Quality

Mining operations within the proximity of arterial and collector roads could adversely affect visual quality. Any open slope or open pit mining would adversely affect visual quality.

Social and Economic

Alternatives 3, 4, and 5 would enhance the lifestyle and job opportunity of those economically dependent on mining while Alternative 2 would limit this lifestyle and opportunity.

SOILS AND WATER

Soil and Water Management Programs protect, conserve, and enhance the soil and water resources. Activities include monitoring water quality, quantity, and the effects of activities on soil, and protecting the resources where needed with structural improvements and other mitigating actions.

Social and Economic

Soil and water management would require additional structural improvements for increased grazing in riparian zones. These improvements must be done in order to maintain soil and water quality. The effect of this would be a slight increase in cost to grazing operations in these areas. All alternatives, except Alternatives 1 and 2 increase grazing in riparian zones.

An adverse economic impact of maintaining water quality and soil production would be realized by timber harvesting operations because of the expense of harvesting in riparian zones. Alternative 3 is the only alternative which allows timber harvest in riparian areas on a regulated basis. Guidelines such as selection cutting, cabling, and handpiling of slash must be followed when harvesting in these areas to prevent sedimentation and decreases in water quality.

LANDS

The Lands Program deals with special use management, land adjustment planning, land exchange and acquisition, and rights-of-way acquisition.

The Preferred Alternative (6) would not have any significant effect on private lands. Under wilderness classification (Alternative 2) there would be a need to acquire the private in-holdings in the Middle Fork of the Judith or protect these values by scenic easement. This would be regarded by some people, especially the landowners, as more unneeded control.

FACILITIES - ROADS AND TRAILS

The Facilities Program provides and maintains capital improvements such as roads and trails. Transportation planning, road engineering and design, construction and maintenance of local, collector, and arterial roads and trails are all activities included in facilities management. Table M4.1 shows the acres disturbed from roading by alternative. Alternatives 3, 4, 5, and 6 (Preferred) would provide roads in the Middle Fork Judith Study Area to support timber harvest activity.

The rolling slopes and headwater basins can be accessed from Kings Hill. Complete access would require additional road construction in the lower canyon area.

Soils & Water

Roading may have an adverse long term, irretrievable effect on the physical environment. Road construction causes the disturbance and removal of the soil which can result in soil erosion, increased sedimentation in streams, and diminished water quality. This effect varies by the amount of road constructed and by the type of soils roads are constructed on. Trail construction has similar effects, but to a much lesser degree. Mitigation measures have been designed to minimize these effects which are outlined in management practices, standards, and guidelines for each management area. Alternatives 3 and 4 show more acres disturbed by roading than Alternatives 5 and 6.

Fish & Wildlife

Road management is a critical element to wildlife, particularly for big game species. Road construction removes vegetation or wildlife forage; however, the critical effect is the increased access people have to the Forest. Human activity and encounters with wildlife can disturb elk calving areas, migration routes, forage areas, and security cover. Potential effects include displacement of animals from their historically used ranges, poaching, and less protection from hunters. Trails management presents some of the same efforts, but again to a much lesser degree. Alternatives 3 and 4 have the most roads. Alternatives 3, 4, 5, and 6 (Preferred) recommend the closure of new roads in critical wildlife habitat. Alternatives 1 and 2 would have no disturbance from new roads.

Recreation

Road construction would affect recreationists by changing the recreation setting from a semi-primitive to a roaded natural appearing setting. This would be considered a long term effect, even though it could be reversed through road closures and restoration of roadbeds. Roading in turn would affect the types of recreation activities and user groups. Roads and trails would increase the motorized recreation opportunity for snowmobiling and trail biking. Table M4.1 shows the acres maintained by the different recreation settings. Alternatives with the highest timber levels would cause the greatest change in recreation settings.

Visual Quality

Road construction would create visual impacts by removing vegetation and disturbing the soil, thus changing the color, texture, and lines of the landscape. In open areas, roads introduce strong lines into the landscape that can be visible for many miles depending on topography and vegetation. Cut and fill areas are often highly visible and may alter the landscape for long periods of time. These impacts would not be as great for alternatives which harvest less timber. Trail construction would have little effect on the visual quality. Visual management objectives provide for mitigating measures to reduce the effects of roading.

Protection

Because roading provides greater access to the Forest, more timber stands which are susceptible to insects and disease may be harvested. Alternatives 3 and 4 provide the greatest opportunity to harvest stands whereas Alternatives 5 and 6 (Preferred) have the least. Increased roading would increase human activity which in turn increases the risk for person-caused wildfire.

Social and Economic

Roading can have indirect economic benefits to timber, ranching, and mining operations because it provides access to timber, rangeland, and minerals. Ease of access reduces the cost to the operation while increasing the available supply of the commodity.

Roading can have an adverse effect upon the symbolic meaning people may attach to the roadless, natural setting of a particular area. On the other hand, roading can provide greater opportunities for people to enjoy the area or derive economic benefit. Road management such as road closure and careful placement of roads can mitigate adverse effects.

PROTECTION - FIRE

The Fire Management Program includes the prevention and suppression of wildfires, the use of fire to dispose of activity-created fuels, and use of prescribed fire to improve resource values.

The effects of wildfire would be basically the same under all alternatives and are discussed only briefly because they are the same. Prescribed fire and fuel disposal are discussed under the resource element that they occur under.

Impacts of wildfire would vary with the intensity of the fire. Intensive fires may adversely affect water and air quality, productivity of the soil, and may have an economic impact through loss of commercial timber and grazing. The continuous vegetation and rolling landform would make control of such a fire more difficult. Favorable impacts from less intense wildfires would be increased levels of nutrient recycling and acceleration of forage growth for big game. Alternative 2 (wilderness) would provide the opportunity for wildfire to burn in certain areas within a prescription.

PROTECTION - INSECT AND DISEASE

The effects of insects and disease are discussed throughout the chapter.

SOCIAL / ECONOMIC FACTORS

The social and economic characteristics of the people surrounding the Lewis and Clark Forest are unique compared to many of the other National Forests. The economic structure is highly dependent upon natural resources such as farming, ranching, logging and lumber processing, and some mining. This dependency is especially true for the rural communities next to the Forest and to a lesser extent for Great Falls (although it too services the agricultural sectors for central Montana). These natural resource sectors provide primary jobs; most of the remaining jobs (retail, services, and construction) are directly dependent upon them. Compared to the rest of the nation and to Montana, there is little manufacturing.

Much of the future growth remains tied to the natural resources. The area has made repeated attempts to lure new business in, but with only limited success. Although it offers many opportunities, its weather and geographic isolation will continue to make businesses look elsewhere. Tightening credit, escalating energy and fertilizer prices, and higher transportation costs continue to make the economic situation bleak. Any alternative which decreases job opportunities would be especially bad because of these economic conditions; likewise, any increase in job opportunities would have beneficial effects.

The Middle Fork Judith is slightly different from most areas in Montana because the ratio, on a county wide basis, of private land to public lands in the local area is much higher than other areas of the State containing National Forest land. Because of the role played by private, state, and other federal lands in the local area's economy, the effects of National Forest management, although important, are relatively small and are confined to three resource areas: timber, range, and recreation.

Discovery of a sizable quanity of marketable hard rock minerals would have a significant additional impact in the population, employment and income of the local communities.

Table M4.1 shows the changes in employment, income, and population by alternative. Also shown are the change in social variables which are discussed throughout this chapter.

Population

Alternatives 3, 4, 5, and 6 would result in an increase in population. Alternatives 3 and 4 would have population increases which may effect small communities such as White Sulphur Springs where processing of increased wood products from these alternatives would take place.

Increased population in the White Sulphur Springs area would most likely increase pressures for land subdivisions. Most rural communities within the area-of-influence want community growth and, therefore the costs of new ownership patterns would be more acceptable.

Employment

Alternatives 3, 4, 5, and 6 (Preferred) provide an increase in job opportunity. This increase would take place in the wood products industry.

Alternatives 1 and 2 would not significantly effect job opportunity.

Job opportunities in the ranching sector are limited because farms and ranches can support only a given number of people and maturing youth will continue to look outside of the area for jobs. This has led to an older population structure in the past and will continue to do so in the future. These age differences will continue to have effects on recreation preferences. The small increase in grazing under Alternatives 3 and 4 (80 AUMs) and Alternatives 5 and 6 (40 AUMs) would have little affect on employment in the ranching sector.

Recreation use under Alternative 1, 3, 4, 5 and 6 (Preferred) would probably not significantly change employment opportunities. Wilderness classification (Alternative 2) could attract additional users but would not cause any major economic effect. The potential for additional outfitter and guide operation could generate some new business in the local area.

Income

Like population and job opportunity, income effects are largely related to the output of the timber resource. Alternative 3, 4, 5, and 6 (Preferred) would increase the income to the area. These alternatives would provide a beneficial effect to local area income.

BIG SNOWIES

SUMMARY OF EFFECTS

Alternative 1
Preferred

Alternative 1 would manage the Big Snowies Wilderness Study Area by maintaining the existing semi-primitive recreation opportunities and retaining all multiple use options. Direct effects would be a loss of primitive recreation and timber management opportunities.

Alternative 2

Alternative 2 would recommend the Big Snowies Wilderness Study Area for wilderness classification. Direct effects would be a loss of semi-primitive motorized recreation and timber management opportunities.

Alternative 3

Alternative 3 would manage the Big Snowies Wilderness Study Area for a high level of commodity products. Employment and income increase the most under Alternative 3. Direct effects would be a loss of semi-primitive recreation opportunities and wildlife security habitat.

Alternative 4

Alternative 4 would manage the Big Snowies Wilderness Study Area for a moderate level of commodity products. Employment and income would increase. This alternative would provide 16,000 acres of semi-primitive recreation opportunities. Direct effects would be the loss of semi-primitive recreation opportunities and wildlife security habitat.

Alternative 5

Alternative 5 would manage the Big Snowies Wilderness Study Area for a low level of commodity products. Employment and income would increase. This alternative would provide 39,100 acres of semi-primitive recreation opportunities. Direct effects would be a loss of semi-primitive recreation opportunities.

Table M4.2 displays some of the outputs and physical, biological, social, and economic effects of the alternatives considered in detail.

TABLE M4.2

RESOURCE PRODUCTION AND EFFECTS BY ALTERNATIVE

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	(Preferred) ALT 1	ALT 2	ALT 3	ALT 4	ALT 5
CHANGE IN RECREATION SETTING BY 2030						
- Primitive (Wilderness)	Thousand Acres	0	+98	0	0	0
- Semi-Primitive	Thousand Acres	0	-98	-98	-82	-59
- Roaded Natural Appearing	Thousand Acres	0	0	+98	+82	+59
VISUAL QUALITY OBJECTIVES						
- Preservation	Thousand Acres	0	98	0	0	0
- Partial Retention	Thousand Acres	98	0	0	16	39
- Modification	Thousand Acres	0	0	98	82	59
WILDLIFE						
- Wildlife Habitat Improvement	Acre Equivalents					
-1982-1990		110	0	290	100	100
-2021-2030		110	0	320	100	100
- Elk Population Potential 1/						
-1982-1990	Number	100	100	100	100	100
-2021-2030		100	100	100	100	100
- Total Land Harvested in Undeveloped Areas by 2030	Acres					
-Nonwinter range		0	0	12000	4830	7300
-Winter range		0	0	0	770	1300
- Average Annual Prescribed Burning for Wildlife Habitat Improvement	Acres	30	0	120	40	30
- Elk Hunter Recreation						
-1982-1990	Hunter Days	1000	1000	1000	1000	1000
-2021-2030		1000	1000	800	900	900
RANGE						
1982-1990	AUMs	3,000	3,000	3,000	3,000	3,000
2021-2030		3,300	3,000	3,600	3,600	3,300

1/ Estimate of maximum number of elk that would use the area a portion of the year.

TABLE M4.2

RESOURCE PRODUCTION AND EFFECTS BY ALTERNATIVE

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	(Preferred) ALT 1	ALT 2	ALT 3	ALT 4	ALT 5
TIMBER						
- Programmed Sales Offered	Million Board Ft.					
-1982-1990		0	0	.4	.4	.4
-1991-2010		0	0	0	0	1.6
-2001-2010		0	0	.2	.2	.2
-2011-2020		0	0	3.9	2.1	1.1
-2021-2030		0	0	5.3	1.9	3.4
- Acres Harvested	Acres					
-1982-1990		0	0	40	40	50
-1991-2000		0	0	0	0	210
-2001-2010		0	0	20	20	30
-2011-2020		0	0	480	260	140
-2021-2030		0	0	660	240	430
- Acres Available, Capable, Suitable	Thousand Acres	0	0	46.1	49.9	44.8
MINERALS						
- Land Available for Oil and Gas Occupancy Leasing	Thousand Acres	9.0	0	9.0	9.0	9.0
LANDS						
- Lands Required for Right-of-Way	Miles	20	0	48	48	38
FACILITIES						
- Disturbance from Roading	Acres					
Arterial and Collector						
-1982-1990		0	0	5.6	5.6	5.6
-1991-2000		0	0	0	0	10.5
-2001-2010		0	0	3.5	3.5	3.5
-2011-2020		0	0	21.7	25.5	7.0
-2021-2030		0	0	32.2	25.5	21.7
Local						
-1982-1990		0	0	5	5	5
-1991-2000		0	0	0	0	10
-2001-2010		0	0	5	5	5
-2011-2020		0	0	25	15	10
-2021-2030		0	0	35	15	20
SOCIAL/ECONOMIC						
- Change in Employment	Person Years					
1982-1990		0	0	5	5	5
2021-2030		0	0	70	25	45
- Change in Income	Thousand Dollars					
1982-1990		0	0	80	80	80
2021-2030		0	0	990	360	640
- Change in Population	People					
1982-1990		0	0	12	12	12
2021-2030		0	0	161	57	103
- Change in Sense of Control/Self-Sufficiency	Index*					
-Less Development		+3	+3	-3	-3	-2
-Nonwilderness		-1	-3	+3	+3	+2
-Wilderness		-1	+3	-3	-3	-2
-Timber		-2	-3	+3	+2	+1
- Change in Symbolic Meaning	Index*					
-Economic Maximum		-2	-3	+3	+2	+2
-Nature/Refuge		+2	+3	-3	-3	-2
- Change in Emotional/ Spiritual Renewal	Index*					
- Human Activity		0	+3	-3	-2	-1

* Factors which reduce the expression of these social variables are shown with a (-) and factors which heighten the expression of these variables are shown with a (+). The numbers 1, 2, and 3 are a relative ranking; 1 is the least and 3 is the most. Factors which are neutral are represented by a (0). A discussion of these social variables is given on pg. 3-28.

DISPERSED RECREATION

The Dispersed Recreation Program essentially maintains an environment for outdoor recreation opportunities. Specific activities include posting signs, clean-up, visitor information services, and patroling for public safety.

Table M4.2 summarizes the changes in recreation setting over 50 years. Dispersed recreation opportunities occur on primitive, semi-primitive, and roaded natural appearing land areas.

Recreation

Alternative 1 (Preferred) maintains a semi-primitive recreation setting. Alternative 2 would give the area wilderness classification that would prohibit motorized recreation use. This would have a significant affect on local users as the Big Snowies provides most of this type of use on public lands for Lewistown and surrounding areas. Alternative 3 would change the recreation setting on the entire 97,885 acres from a semi-primitive to a roaded natural appearing setting. Alternative 4 is similar to 3, except 16,000 acres would remain in a semi-primitive recreation setting. Alternative 5 would change the recreation setting on 58,845 acres from a semi-primitive to a roaded natural appearing setting.

Timber

No timber harvest would occur under Alternatives 1 (Preferred) and 2. Alternative 3 would offer the largest amount of timber for harvest, and Alternatives 4 and 5, in that order, would offer less timber harvest.

Protection

Because recreation use levels are expected to increase over time, the number of person-caused fires would also increase. This adverse effect would be the same for all alternatives.

WILDERNESS

The Wilderness Program provides for protection and preservation of large areas in their natural state. Primitive recreation takes place within classified wilderness and this opportunity can be maintained with no additional impacts on the environment.

Table M4.2 shows comparison of the acres in wilderness for each alternative. Alternative 2 is the only alternative with recommended wilderness and thus, the only alternative affected by the Wilderness Management Program.

Recreation

Recommended wilderness under Alternative 2 would shift the semi-primitive recreation opportunity to primitive recreation. Opportunities for both primitive and semi-primitive recreation are high. Under wilderness classification, the area would be closed to motorized recreation. There would be a loss of 1,700 RVDs of motorized recreation per year.

Soils & Water

Alternative 2 with wilderness classification would protect the watershed of the Big Snowies and the soils from resource activities.

Diversity

Vegetative diversity may decrease. Natural diversity is high in the study area; both climax timber and grassland species are present. Management fire in wilderness would be used as a natural method of vegetative management and maintaining diversity. Alternative 2 would fill the target for the Foothills Prairie Ecosystem in the National Preservation System.

Protection

Under wilderness classification (Alternative 2), the risk of mountain pine beetle infestations reaching epidemic levels would increase significantly. Currently much of the timber resource is mature or overmature lodgepole pine which would be susceptible to the insects. The potential for Douglas fir beetle and spruce beetle infestations is not considered to be significant.

Air Quality

Management fire in wilderness (Alternative 2) may adversely affect air quality, visibility, and odor throughout the local area.

Social and Economic

Access for mineral activities would be subject to restrictions under wilderness and could increase the costs to miners. Mineral potential is low in the Big Snowies.

Timber harvesting opportunities, averaging 3.4 million board feet per year, will be foregone in Alternative 2. In order to maintain the Forest's harvest level, other areas would need to be more intensively managed.

An increase of visitors to the study area due to the wilderness classification could help the local economy, and other recreation-related businesses.

The social variable of sense of control and self sufficiency would be affected by the wilderness designation of the study areas. Those people who do not want wilderness designations would feel a loss of control by Alternative 2, and increased control in the other alternatives. This would be especially true in nearby Lewistown where most of the users reside. The same alternatives would create the opposite feelings for those people wanting wilderness designation.

Social benefits in wilderness classification under Alternative 2 would exist, especially for people who enjoy non-motorized use. People recognize the intrinsic benefits of having a pristine environment nearby, such as being able to "get away from it all," having plants and animals in their natural state of observation, hunting, fishing, backpacking, and hiking in an environment without the impacts of man, and having the knowledge that an undeveloped area is nearby. Wilderness classification would help improve the distribution of wilderness in Montana.

Wilderness designation would result in the area being managed in such a manner as to leave it unimpaired for future generations use and enjoyment. It would provide valuable opportunities for research and study of natural life processes which are largely undisturbed by man.

OTHER ALTERNATIVE

Alternative 1 (Preferred), 3, 4, and 5 forego the opportunity for wilderness classification at this time. Alternative 1 (Preferred) would retain the opportunity for future wilderness classification on all 97,885 acres. Alternative 4 would retain the opportunity for future wilderness classification on 16,000 acres and Alternative 5 on 39,040 acres.

WILDLIFE AND FISH

Wildlife and fish management is the maintenance and improvement of wildlife and fish habitat. Activities include vegetation management for increasing the amount of shrubs, forbs, and grass available to various species as well as protecting some sites as they exist for species depending upon an "old growth" environment. Maintaining security cover for some animals and minimizing the disturbances of human activity in calving areas, migration routes, and T&E species habitat are also objectives. Activities in fisheries management include minimizing sediment in streams, fish structure maintenance, and channel stabilization.

Table M4.2 lists wildlife habitat improvements. Elk populations are reported to reflect habitat capacity.

All alternatives, except Alternative 2 (wilderness), have wildlife and fish habitat programs, although the management activities for Alternative 3 is primarily done to mitigate some of the adverse effects from other resource activities such as roading and timber harvesting.

Under all alternatives elk number will not be affected. The small elk herd provides limited hunting opportunity on a permit basis.

Recreation

A change is projected in hunter recreation under the alternatives that proposed development (3, 4, and 5). Table M4.2 shows hunter recreation by alternative.

Social and Economic

The wildife and fish management program has both beneficial and adverse effects upon the economy of the State and surrounding communities. Favorable economic effects of intensitve wildlife management would be an increase in recreation opportunity, visitors to the area, and thus, an indirect effect of increasing income to the local economies. Alternative 2 would provide the most benefit.

RANGE

The Range Management Program provides for efficient livestock grazing on forest and rangelands commensurate with other needs. Activities include management of range permits, monitoring range use, and maintaining and constructing range improvements, such as fences and water developments.

Table M4.2 shows the acres grazed by domestic livestock for each alternative.

Soils & Water

All alternatives except Alternative 2 increase grazing over a 50-year period. Mitigation measures are listed in the management practices, standards, and guidelines for grazing in riparian zones. Proper distribution of livestock would be acheived through the placement of salt and construction of fences.

Range

Burning to change the vegetation to seral stage would have a long term benefit for the range resource by maintaining a high level of forage production. Alternatives 1 (Preferred), 3, and 4 burn the most acres by prescription for range management.

Construction of fences and water developments improve the distribution of livestock, provide additional grazing use, reduce overused areas, and improve the vigor and production of forage.

Wildlife & Fish

Livestock grazing has an adverse effect on big game; primarily where grazing occurs on big game winter ranges.

Although population number would not be affected, elk would be affected somewhat under Alternatives 1 (Preferred), 3, 4, and 5 which provide for increases in AUMs for livestock. The increases in AUMs would occur on both winter and summer big game range. Competition between livestock and elk could have an adverse effect on elk on summer ranges. The opportunity to effectively mitigate adverse impacts upon big game becomes less as domestic livestock allocations increase.

Social and Economic

All alternatives except 2 increase livestock grazing to provide more beef, lamb, and wool to the consumer. This would generate increases in income to the local level industry and increase grazing receipts to the U.S. Treasury. Alternatives 3 and 4 would increase grazing by 33 percent over the current level. Alternatives 1 (Preferred) and 5 would increase grazing by 22 percent over the current level.

An increase in grazing opportunity over time for all alternatives except Alternative 2 has a beneficial effect upon the ranching operations by assuring a constant supply of land for grazing. The feeling of certainty for ranchers about future supply would be the greatest under Alternatives 3 and 4. While the percentage of grazing provided by the Big Snowies is not large in comparison with total grazing, the increases in grazing does have some economic benefit to the local area.

TIMBER

The Timber Management Program ensures the growth and use of the timber resource for the benefit of the Nation. Activities include the scheduling of timber harvest, administration of timber sales, timber stand improvements such as thinning, and the reforestation of harvest sites through site preparation and planting. Road construction and maintenance, an activity closely associated with timber harvest, are discussed later in the chapter under Facilities. Table M4.2 gives the harvest volumes, the acres harvested, and acres available, capable, and suitable for timber management.

The Preferred Alternative (1) does not program any regulated timber harvest in the Big Snowies Study Area. About 98 million board feet would be available during the 50 year planning period if this area was fully developed under Alternative 3. This would take a high investment in roads and rights-of-way to access. The failure to harvest timber periodically is an irretrievable loss of products. Alternative 4 would harvest 46 million board feet and Alternative 5, about 67 million board feet.

Wilderness classification (Alternative 2) would prohibit harvesting timber except for wilderness or mineral purposes.

Soils & Water

Water yield from Alternatives 3, 4, and 5 is less than a 2 percent increase per decade. This change is less than the annual variation in water yield due to natural factors. These alternatives would also have the highest levels of sedimentation. Mitigation measures to prevent soil erosion from timber harvest would include directional felling of trees, waterbarring on skid trails, and seeding landings.

Recreation

Alternatives 3, 4, and 5 would develop the most land for motorized use. The Preferred Alternative (1) would maintain the study area in a semi-primitive setting.

Favorable social effects of increased roading include increased opportunity for recreationists who enjoy motorized use, although this would depend on the road management for the area. Timber harvest would adversely affect those people who enjoy an unroaded recreation setting and a natural landscape.

Air Quality

Air quality would be affected a few days during the fall and spring as a result of prescribed fires for disposal of activity fuels and composition and stocking control under Alternatives 3, 4, and 5 (see Table M4.2).

Visual Quality

Timber management activities have significant effects on visual quality. Although the impacts of timber management are generally short term, the immediate change to the existing landscape is undesirable to many Forest visitors. The establishment of visual quality objectives provides the method for carrying out timber management and other activities while protecting the visual resource. Treatments would be spaced and timed so that adverse visual impacts are minimized. Alternatives 3 and 4 would have the greatest potential for disruption of the visual resource.

Wildlife & Fish

Timber harvest provides wildlife forage and habitat diversity by creating different age classes of trees. Timber harvesting reduces hiding and thermal cover primarily impacting fall big game ranges. The Preferred Alternative (1) would maintain big game security habitat on 97,885 acres. Alternatives 3, 4, and 5 would affect security habitat.

Wildlife species associated with old growth could be adversely affected under Alternatives 3, 4, and 5. Less acres would be maintained as old growth which would decrease habitat available for these species. Habitat for wildlife species using the grass/forb stage would increase under these alternatives. Human use, equipment operation, and other noises associated with timber harvesting activities could have a short term effect on the distribution of wildlife.

Range

Timber management is the greatest contributer to habitat modification. Additional forage for wildlife and domestic livestock can be created through timber harvesting. Alternatives 3, 4, and 5 would increase transitory range for domestic livestock.

Protection

Timber harvesting would be used to control insects and disease, particularly in Alternatives 3, 4, and 5. Under these alternatives, the Forest would be less susceptible to mountain pine beetle attacks because more acres are in a variety of age classes created through timber management activities. Alternatives 1 and 2 provide for the least protection from mountain pine beetle infestation.

Accumulation of fuels results from timber harvesting and increases the risk of forest fires. This effect would be mitigated under all alternatives by piling and burning of the slash.

Social and Economic

Increases in the level of timber harvest would help meet the demand for wood products and help stabilize timber dependent communities. The Preferred Alternative (1) would not contribute to the Forest's Timber Sale Program. Alternatives 3, 4, and 5 would increase employment, personal income, and county and Federal receipts.

The economic benefits generated under Alternatives 3, 4, and 5, would help to increase the sense of control, self sufficiency, and cohesion within timber dependent communities such as Judith Gap by producing a more optimistic economic outlook which could increase community spirit. Alternatives that increase harvesting would help relieve the uncertainty for the timber industry.

MINERALS
OIL AND GAS

The Minerals Program administers mineral exploration and development on National Forest System lands compatible with other resource values. Oil and gas exploration and development is carried out by private companies under a land leasing program. The BLM (Bureau of Land Management) is responsible for oil and gas leasing. The Forest Service reviews lease applications and recommends to the BLM what National Forest lands should be leased and what controls (stipulations) are needed to protect surface values and uses.

Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling for any given lease block (a collection of leases held by one company).

The Big Snowies Study Area is considered low in gas and oil potential. However, application has been made for leasing 54,500 acres within the study area.

Alternatives 3, 4, and 5 would increase the opportunity for exploration and development of potential gas and oil reserves. They would also have the greatest effect on the environment as described in this section. Alternative 1 (Preferred) would provide less opportunity for oil and gas exploration and development because semi-primitive recreation areas would be protected by recommended leases with stipulations for limited surface use and timing restrictions.

Alternative 2 (wilderness) would be the most restrictive by recommending leases with stipulations for non-surface occupancy, limited surface use, and timing restrictions.

Soils & Water

Soil productivity may be adversely affected by off-road vehicle travel. This can be avoided by limiting off-road travel to dry periods during the summer and fall and by avoiding compaction-prone soils.

The use of explosives in seismic surveys creates small holes or trenches in the soil. These areas should return to their original condition in a relatively short time; less than two years.

Construction of roads, drill pads, and other facilities would result in soil disturbance and would require measures to prevent erosion and increased sediment in streams.

Air Quality

The effects on air quality are generally short term. Dust from trucks and other equipment as they traverse the roads are a minor impact. A cloud of smoke and dust would dissipate into the air from each blast when explosives are used on the surface.

Vegetation

The method, type, and amount of explosive used would vary the amount of vegetative disturbance. Vegetation that is damaged by surface types of explosives would grow back in a relatively short period of time depending on the time of year, amount of moisture in the soil, and type of vegetation on the site. There would be little change in species composition. Drilling would disturb the vegetation and require some reclamation.

Construction of drill pads and roads would result in destruction of existing vegetation. The relatively small minor area disturbed by oil and gas activities should have little effect on native plant communities. Disturbed areas would be seeded with grass and native shrubs.

Recreation

Oil and gas activities would affect the quality of the recreation setting. The effect would be particularly noticeable in semi-primitive settings where the introduction of roads and motorized use would be distracting. Some business operations, such as outfitters and guides, could be adversely affected by the disruption of the semi-primitive recreation setting by oil and gas activity. Traditionally used campsites would be protected by no occupancy stipulations.

Noise from helicopters transporting personnel and moving of equipment would take place during any portable seismic activity. Also, when surface charges are detonated, the noise from the blast may be audible for several miles depending on the terrain and location of the operation.

User conflict on roads may take place between the general public, log hauling traffic, and oil and gas exploration traffic.

Visual Quality

Standards for pad site and road reclamation are designed to return the setting to a natural condition except that visual quality may be slightly lowered due to contrasting color and shape.

Wildlife

The timing and location of preliminary exploration and exploratory drilling activities in relation to key habitat use patterns would determine the significance of disturbances or displacement. The greatest potential conflict would be during use periods on restricted key habitat, such as big game concentration areas and migration routes. Direct mortality from seismic activity is very unlikely. Wildlife habitat loss or degradation would be negligible during preliminary exploration.

The sensitivity periods for big game are as follows:

Elk winter range	12/1 to 4/30
Elk calving areas	5/1 to 6/30
Mule deer winter range	12/1 to 4/30
Mountain goat winter range	12/1 to 4/30
Mountain goat kidding areas	5/1 to 6/30

Effects on wildlife would include possible destruction of habitat by road, drill pad, and other facility construction. The destruction of habitat could be significant if the habitat is important and limited.

Range

Human activity, blasting, and helicopter use may affect livestock habitat use patterns for short periods of time. Critical areas can be protected by no-surface occupancy stipulations.

Social and Economic

The preliminary exploration is usually performed by persons from outside the local area. Demand for services in the Monarch, Neihart, and Stanford communities would increase slightly during exploration.

Leasing National Forest lands for oil and gas exploration increases revenue to the Federal Treasury.

A discovery of oil and gas that would lead to production of oil or gas would have significant social and economic effects. Local community populations, employment, income, and community cohesion would change. Individuals lifestyles, job dependence, their sense of control, self sufficiency, and feelings of certainty and uncertainty would be affected.

METALLICS

The Minerals Program administers the mineral exploration and development on National Forest System lands compatible with other resource values. Exploration and development of metallic or hard rock minerals are carried out by private companies. Mineral prospecting and extraction normally occur on National Forest lands.

Metallic mineral exploration and development will occur under all alternatives. Alternatives 1 (Preferred) and 2 would be more restrictive on metallic mineral activities.

Soils & Water

The mineral potential is low. Soil disturbance would require restoration measures and special measures would be needed to prevent increased sedimentation in the local streams. Underground mining would create mine tailing disposal sites of 1 to 13 acres in size. Mitigation of these disposal sites would include site location away from live water, landscaping, and revegetation measures. Access roads and trails would be constructed under the Forest Management Practices, Standards, and Guidelines.

Wildlife and Fish

Small mammal and fish habitat could be eliminated in localized areas of placer and dredging operations. Revegetation measures would help reestablish these habitats.

Human activity and noise of mining operations would displace big game in the immediate area. Hauling of ore from underground mines would increase traffic and could increase big game road mortality along migration routes.

Visual Quality

Mining operations within the proximity of arterial and collector roads could adversely affect visual quality. Any open slope or open pit mining would adversely affect visual quality.

Social and Economic

Alternatives 3, 4, and 5 would enhance the lifestyle and job opportunity of those economically dependent on mining while Alternative 2 would limit this lifestyle and opportunity.

SOILS AND WATER

Soil and Water Management Programs protect, conserve, and enhance the soil and water resources. Activities include monitoring water quality, quantity, and the effects of activities on soil. Other activities protect the resources where needed with structural improvements and other mitigating actions.

Social and Economic

Soil and water management would require additional structural improvements for increased grazing in riparian zones. These improvements must be done in order to maintain soil and water quality. The effect of this would be a slight increase in cost to grazing operations in these areas. All alternatives, except Alternative 2 increases grazing in riparian zones.

An adverse economic impact of maintaining water quality and soil production would be realized by timber harvesting operations because of the expense of harvesting in riparian zones. Alternative 3 is the only alternative which allows timber harvest in riparian areas on a regulated basis. Guidelines such as selection cutting, cabling, and handpiling of slash must be followed when harvesting in these areas to prevent sedimentation and decreases in water quality.

LANDS

The Lands Program deals with special use management, land adjustment planning, land exchange and acquisition, and rights-of-way acquisition.

None of the alternatives would have significant effect on private lands.

Alternatives 1 (Preferred) and 2 would require approximately 20 miles of rights-of-way to the 80 miles of existing trails. Alternatives 3 and 4 would require 48 miles of rights-of-way and Alternative 5, 38 miles.

Private citizens whose lands are involved in rights-of-way may be adversely impacted. These effects include possible range management problems such as the need for additional fencing. Also with the public in close proximity to private lands, littering and vandalism problems could result.

Favorable economic and social effects would be more public lands available for a variety of uses, such as recreation and firewood gathering.

FACILITIES - ROADS AND TRAILS

The Facilities Program provides and maintains capital improvements such as roads and trails. Transportation planning, road engineering and design, construction and maintenance of local, collector, and arterial roads and trails are all activities included in facilities management. Table M4.2 shows the acres disturbed from roading by alternative. The uplifted landform of the Big Snowies would require many roads to access the rounded basins and ridgetops. Many roads would serve only a single drainage. Alternatives 3, 4, and 5 would provide roads in the Big Snowies Study Area to support timber harvest activity.

Soils & Water

Roading may have an adverse long term, irretrievable effect on the physical environment. Road construction causes the disturbance and removal of the soil which can result in soil erosion, increased sedimentation in streams, and diminished water quality. This effect varies by the amount of road constructed and by the type of soils roads are constructed on. Trail construction has similar effects, but to a much lesser degree. Mitigation measures have been designed to minimize these effects which are outlined in management practices, standards, and guidelines for each management area. Alternatives 3 and 4 show more acres disturbed by roading than Alternative 5.

Fish & Wildlife

Road management is a critical element to wildlife, particularly for big game species. Road construction removes vegetation or wildlife forage; however, the critical effect is the increased access people have to the Forest. Human activity and encounters with wildlife can disturb elk calving areas, migration routes, forage areas, and security cover. Potential effects include displacement of animals from their historically used ranges, poaching, and less protection from hunters. Trails management presents some of the same efforts, but again to a much lesser degree. Alternatives 3 and 5 have the most roads. Alternatives 3, 4, and 5 recommend the closure of new roads in critical wildlife habitat. Alternative 1 (Preferred) provides for the least disturbance from roads. Alternative 2 (wilderness classification) would require 50 miles of existing roads to be closed.

Recreation

Road construction would affect recreationists by changing the recreation setting from a semi-primitive to a roaded natural appearing setting. This would be considered a long term effect, even though it could be reversed through road closures and restoration of roadbeds. Roading in turn would affect the types of recreation activities and user groups. Roads and trails would increase the motorized recreation opportunity for snowmobiling and trail biking. Table M4.2 shows the acres maintained by the different recreation settings. Alternatives with the highest timber harvest levels would cause the greatest change in recreation settings.

Visual Quality

Road construction would create visual impacts by removing vegetation and disturbing the soil, thus changing the color, texture, and lines of the landscape. In open areas, roads introduce strong lines into the landscape that can be visible for many miles depending on topography and vegetation. Cut and fill areas are often highly visible and may alter the landscape for long periods of time. These impacts would not be as great for alternatives which harvest less timber. Visual management objectives provide for mitigating measures to reduce the effects of roading.

Protection

Because roading provides greater access to the Forest, more timber stands which are susceptible to insects and disease may be harvested. Alternatives 3, 4, and 5 provide the greatest opportunity to harvest stands whereas Alternatives 1 (Preferred) and 2 have the least. Increased roading would increase human activity which in turn increases the risk for person-caused wildfire.

Social and Economic

Roading can have indirect economic benefits to timber, ranching, and mining operations since it provides access to timber, rangeland, and minerals. Ease of access reduces the cost to the operation while increasing the supply of the commodity.

Roading could have an adverse effect upon the symbolic meaning people may attach to the roadless, natural setting of the Big Snowies. On the other hand, roading can provide greater opportunities for people to enjoy the area or derive economic benefit. Road management such as road closure and careful placement of roads can mitigate some adverse effects.

PROTECTION - FIRE

The Fire Management Program includes the prevention and suppression of wildfires, the use of fire to dispose of activity-created fuels, and use of prescribed fire to improve resource values.

The effects of wildfire would be basically the same under all alternatives and are discussed only briefly because they are the same. Prescribed fire and fuel disposal are discussed under the resource element that they occur under.

Impacts of wildfire would vary with the intensity of the fire. Intensive fires may adversely affect water and air quality, productivity of the soil, and may have an economic impact through loss of commercial timber and grazing. Natural breaks in vegetation and landform would aid in the control of such a fire. Some favorable impacts from less intense wildfires include higher levels of nutrient recycling and acceleration of forage growth for big game. Alternative 1 (Preferred) and Alternative 2 (wilderness) would provide the opportunity for wildfire to burn in certain areas within a prescription.

PROTECTION - INSECT AND DISEASE

The effects of insects and disease are discussed throughout the chapter.

SOCIAL / ECONOMIC FACTORS

National Forest lands in Montana exert a strong economic influence on local communities and the people who live there. The Big Snowies are no exception. The study area is different, however, because the ratio on a county wide basis of private land to public lands in the local area is much higher than other areas of the State having National Forest lands. Therefore, the role played in the local area's economy by National Forest management, although important, is relatively small. Impacts are primarily confined to two resource areas: timber and range.

Table M4.2 shows the changes in employment, income, and population by Alternative. Also shown are the change in social variables which are discussed throughout this chapter.

Population

Alternatives 3, 4, and 5 would result in an increase in population. These population increases may effect small communities such as Judith Gap where the processing of increased wood products from these alternatives would take place.

Increased population in the Judith Gap area would most likely increase pressures for land subdivisions. Most rural communities within the area-of-influence want community growth and, therefore the costs of new ownership patterns would be more acceptable.

An increased density of homes on private lands would conflict with some residents' sense of appropriate private land use.

Employment

Alternatives 3, 4, and 5 provide some increase in job opportunity. This increase would take place in the wood products industry.

Alternatives 1 (Preferred) and 2 would not significantly effect job opportunity.

Recreation use under Alternatives 1, 3, 4, and 5 (Preferred) would probably not significantly change employment opportunities. Wilderness classification (Alternative 2) could attract additional users but would not cause any major economic effect.

Job opportunities in the ranching sector are limited because farms and ranches can support only a given number of people. Maturing youth will continue to look outside of the area for jobs. This has led to an older population structure in the past and will continue to do so in the future. These age differences will continue to have effects on recreation preferences. While the 600 AUM grazing increase under Alternative 1 (Preferred) is significant in the management of the Big Snowies, it would have little effect on the overall ranching sector.

Income

Like population and job opportunity, income effects are largely related to the output of the timber resource. Alternatives 3, 4, and 5 would increase the income to the area. These alternatives would provide a beneficial effect to local area income.

DEIS

CHAPTER V
LIST OF PREPARERS

Overview

This chapter lists those people who were primarily responsible for preparing this DEIS. Over the past three years almost every permanent employee of the Lewis and Clark National Forest has been involved in some phase of Forest Planning.

A "Special Thanks" is given to:

> The field going personnel who toiled over numerous maps, computer runs, and review documents to ensure that that proposed actions fit the land.
>
> Sid Jensen, Shipley Associates, who reviewed the draft versions of this document.
>
> Andie Greer, whose typing skills enabled us to make the many changes and revisions that were needed.
>
> Ed Heist, Northern Region; Planning, Programming, and Budgeting; who helped make sure that this document conformed to the latest planning direction.

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Forest Supervisor (1980-Present)	J. Dale Gorman B.S. - Forest Management; 19 years experience in forestry and administration.
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Forest Engineer	Bill Duryee B.A. - Education, B.S. - Civil Engineering; 22 years experience in civil engineering and administration.

Resource Core Group

Responsibility	Member Qualifications and Experience
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Minerals Analysis and Planning	Nancy Kidd B.S. - Geology; 9 years experience in geology and minerals.
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Systems Core Group (cont'd)

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DEIS
CHAPTER VI

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APPENDIX A

DEIS LEWIS AND CLARK NATIONAL FOREST PLAN

PLANNING RECORDS

Throughout this environmental impact statement reference is made to more detailed documents available at the Lewis and Clark National Forest Supervisor's Office. Appendix A lists those planning documents that are available on request. Other documents are available for review during normal business hours (8:30 am to 4:30 pm, weekdays, except holidays) at the Supervisor's Office in Great Falls, Montana. Requests for copies of available planning records should be sent to:

Lewis and Clark National Forest
P.O. Box 871
Great Falls, Montana 59403

(1) "Lewis and Clark National Forest Work Plan," Lewis and Clark National Forest, November 1978.

(2) "Data Base Components," Lewis and Clark National Forest, November 1979.

(3) "Social Impact Assessment Baseline, 1980," Lewis and Clark National Forest, December 1980.

(4) "Alternatives from Public Involvement," Lewis and Clark National Forest, March 1981.

(5) "Analysis Areas," Lewis and Clark National Forest, April 1981.

(6) "Proposed Criteria and Documentation," Lewis and Clark National Forest, August 1981.

(7) "Analysis of the Management Situation," Lewis and Clark National Forest, August 1981.

(8) "Alternatives," Lewis and Clark National Forest, August 1981.

(9) "Management Guideline Analysis Report," Lewis and Clark National Forest, August 1981.

(10) "Identification of Public Issues and Management Concerns," Lewis and Clark National Forest, January 1982.

(11) "Economic Data and Analysis," Lewis and Clark National Forest, January 1982.

(12) "Yield Coefficients," Lewis and Clark National Forest, January 1982.

(13) "Management Prescriptions," Lewis and Clark National Forest, January 1982.

(14) "Lewis and Clark FORPLAN Model," Lewis and Clark National Forest, January 1982.

(15) "Management Practices," Lewis and Clark National Forest, January 1982.

(16) "Input/Output Model," Lewis and Clark National Forest, January 1982.

APPENDIX B

DEIS LEWIS AND CLARK NATIONAL FOREST PLAN

GLOSSARY

A

Access	See Public Access.
Acre-Equivalent (AE)	A unit of habitat output related to fish or wildlife habitat improvement projects. Acre equivalents are based on the acres of habitat that are influenced by an acre of habitat actually modified by the project. For example, an acre of winter range burned is credited with influencing 4 acres of summer range.
Acre-Foot	A measure of water or sediment volume equal to the amount which would cover an area of 1 acre to a depth of 1 foot (325,851 gallons or 43,560 cubic feet).
Activity Fuels	Logging debris generated from any activity on the Forest such as firewood gathering, precommercial thinning, timber harvesting, and road construction, which causes fire potential.
Administrative Facilities	Those facilities, such as ranger stations, work centers, and cabins, which are used by the Forest Service in the management of the National Forest.
Affected Environment	The natural and physical environment and the relationship of people to that environment that will or may be changed by actions proposed.
Allocation	The assignment of management prescriptions to particular land areas to achieve the goals and objectives of the alternative.
Allocation Model	See Resources Allocation Model.
Allotment	See Range Allotment.
Allowable Sale Quantity	The quantity of timber that may be sold from the area of land covered by the Forest Plan for a time period specified by the plan. This quantity is usually expressed on an annual basis as the average annual allowable sale quantity.
Alternative	In Forest planning, a mix of management prescription applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives.

Analysis Area	Homogenous areas of land formed from data stored in the data base and criteria from the Interdisciplinary Team.
Analysis of the Management Situation	A determination of the ability of the planning area to supply goods and services in response to society's demand for those goods and services.
Animal Unit Month (AUM)	The quantity of forage required by one mature cow (1,000 lbs.) or the equivalent for one month.
Arterial Roads	Roads comprising the basic access network for National Forest System administrative and management activities. These roads serve all resource elements to a substantial extent, and maintenance is not normally determined by the activities of any one element. They provide service to large land areas and usually connect with public highways or other Forest arterial roads to form an integrated network of primary travel routes. The location and standard are determined often by a demand for maximum mobility and travel efficiency rather than by a specific resource management service. Usually they are developed and operated for long-term land and resource management purposes and constant service.
Available, Capable, and Suitable	See Available Lands, Capable Lands, and Suitable Lands.
Available Lands	Land that has not been legislatively withdrawn or administratively withdrawn by the Secretary of Agriculture or Forest Service Chief from timber production.

B

Base Timber Harvest Schedule	The timber harvest schedule in which the planned sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade of the planning period and this planned sale and harvest for any decade is not greater than long-term sustained yield capacity.
Benchmark Levels	The outputs and cost for managing the Forest at certain levels so that a comparison could be made on costs, values, and effects of the alternatives. Benchmark levels were developed for: minimum maintenance, maximum resource potentials, and maximum net present value.

Big Game	Those species of large mammals normally managed as a sport hunting resource.
Big Game Winter Range	The area available to and used by big game through the winter season.
Blackfeet Treaty Rights Area	Those lands on the Rocky Mountain Ranger District in which the Blackfeet Indian Nation retained certain use rights under the Treaty of 1896.
Board Foot	A unit of timber measurement equaling the amount of wood contained in an unfinished board 1 inch thick, 12 inches long, and 12 inches wide.
Board Foot/Cubic Foot Conversion Ratio	Both board foot and cubic foot volumes can be determined for timber stands. The number of board feet per cubic foot of volume varies with tree species, diameter, and height, and form factors. For the Lewis and Clark the Forest-wide average conversion ratio is 3.4 board feet per cubic foot.
Browse	Twigs, leaves, and young shoots of trees and shrubs which animals feed on; in particular, those shrubs which are utilized by big game animals for food.

C

Capability	The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils and geology, as well as the application of management practices, such as silviculture or protection from fires, insects, and disease.
Capable Lands	Those portions of the Forest that have an inherent ability to support trees for timber harvest and produce at least 20 cubic feet/acre/year of wood fiber.
Carrying Capacity	The number of organisms of a given species and quality that can survive in, without causing deterioration of, a given ecosystem through the least favorable environmental conditions that occur within a stated interval of time.

CEQ	See Council on Environmental Quality
CFR	Code of Federal Regulations
Clearcutting	Harvesting of all trees in one cut on an area for the purpose of creating a new, even-aged stand. The area harvested may be a patch, stand, or strip large enough to be mapped or recorded as separate age class in planning. Regeneration is obtained through natural seeding, or through planting or direct seeding.
Coefficients	These are the costs for producing various Forest resources (cost coefficients), the value of products or use (value coefficients), and the outputs from the Forest (yield coefficients).
Collector Roads	Roads constructed to serve two or more elements but which do not fit into the other two categories (arterial or local). Construction costs of these facilities are prorated to the respective element served. These roads serve smaller land areas and are usually connected to a Forest arterial or public highway. They collect traffic from Forest local roads or terminal facilities. The location and standard are influenced by both long-term multi-resource service needs and travel efficiency. Forest collector roads are operated for constant or intermittent service, depending on land use and resource management objectives for the area served by the facility.
Commercial Forest Land (CFL)	Forest land which is producing or is capable of producing crops of industrial wood and which has not been reserved or deferred. This includes areas suitable for management to grow crops of industrial wood generally of a site quality capable of producing in excess of 20 cubic feet per acre of annual growth. This includes both accessible and inaccessible areas. Permanently inoperable or nonstockable areas are excluded because they are not suitable for silvicultural management. Conversely, nonstocked areas which are stockable and otherwise meet this definition are included.
Commodity Outputs	A resource output with commercial value; all resource products which are articles of commerce.
Concern	See Management Concern.
Consumptive Use	Those uses of a resource that reduce the supply. For example, some consumptive uses of water are: irrigation, domestic, and industrial use.

Continental Divide	The drainage divide that separates the Mississippi and Columbia River basins.
Corridor	A linear strip of land which has ecological, technical, economic, social, or similar advantages over other areas for the present or future location of transportation or utility.
Cost Efficiency	A comparative measure of economic efficiency determined by maximizing the present net value of an alternative, subject to meeting the objectives of the alternative.
Council on Environmental Quality	An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.
Cultural Resources	The physical remains (artifacts, ruins, burial mounds, petroglyphs) and conceptual content or context (as a setting for legendary, historic, or prehistoric events, as a sacred area of native peoples) of an area which is useful or important for making land use planning decisions.

D

Departure	In order to meet overall multiple use objectives, the Secretary may establish an allowable sale quantity for any decade which departs from the projected long-term average sale quantity that would otherwise be established.
Dependent Communities	Communities whose social, economic, or political life would become discernably different in important respects if market or non-market outputs from the National Forests were cut off.
Developed Recreation	Use of a developed recreation site.
Developed Recreation Site	Relatively small, distinctly defined area where facilities are provided for concentrated public use (campgrounds, picnic areas, swimming areas).
Dispersed Recreation	That portion of outdoor recreation use which occurs outside of developed sites.

District Ranger	The official responsible for administering the National Forest System Lands on a Ranger District.
Diversity	The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.
Dry Forest	Commercial Forest land that usually receives less than 25 inches of precipitation per year. Includes the following habitat series: limber pine, ponderosa pine, Douglas fir/bluebunch wheatgrass, Douglas fir/white spirea, Douglas fir/nine bark, and subalpine fir/virgin's bower. The dry forest produces from 20 to 49 cubic feet/acre/year.

E

Early Forest Succession	The biotic community that develops immediately following the removal or destruction of the vegetation in an area.
Effects	Results expected to be achieved or actually achieved related to physical, biological, and social (cultural and economic) factors resulting from the achievement of outputs. Examples of effects are tons of sediment, pounds of forage, person-years of employment, and income. There are direct effects, indirect effects, and cumulative effects.
Endangered Species	Plant or animal species identified by the Secretary of Interior as endangered in accordance with the 1973 Endangered Species Act.
Ending Inventory Constraint	Constraint to ensure that the total timber volume left at the end of the planning horizon will equal or exceed the volume that would occur in a regulated managed forest.
Environmental Analysis	An analysis of alternative actions and their predictable short- and long-term environmental effects which include physical, biological, economic, social, and environmental design factors and their interactions.
Environmental Assessment	The concise public document required by the regulations for implementing the procedural requirements of NEPA (40 CFR 1508.9).

Even-Aged Silviculture	The combination of actions that result in the creation of stands in which trees of essentially the same age grow together. Clearcutting - The removal, in a single cut, of all trees in stands larger than seedlings. Shelterwood Cutting - The removal of all trees in a series of two or more cuts over a period of not more than 20 years. Seed Tree Cutting - Similar to clearcutting, except that a few of the better trees of the desired species are left scattered over the area to provide seed for regeneration.

F

Facility Condition Class	The rating system used in the Recreation Information Management System to classify the condition and maintenance needs of recreation sites and areas.
Fee Site	A Forest Service recreation area in which users must pay a fee. Fee sites must meet certain standards and provide certain facilities as specified in the Forest Service Manual.
Final Cut	Removal of the last seed bearers or shelter trees after regeneration is considered to be established under a shelterwood system.
Forage	Forage refers specifically to all browse and non-woody plants that are available to livestock or game animals and used for grazing or harvesting for feeding.
Forest and Rangeland Renewable Resources Planning Act of 1974	An act of Congress requiring the preparation of a program for the management of the National Forest's renewable resources and of land and resource management plans for units of the National Forest System. It also requires a continuing inventory of all National Forest System lands and renewable resources.

Forest Supervisor	The official responsible for administering the National Forest System lands in a Forest Service Administrative unit, which may consist of two or more National Forests or all the Forests within a State.
Forest System Roads	Roads that are part of the Forest development transportation system, which includes all existing and planned roads, as well as other special and terminal facilities designated as Forest development transportation facilities.
FORPLAN	A linear programming system used for developing and analyzing Forest planning alternatives.
Forest Wide Management Guideline	An indication or outline of policy or conduct dealing with the basic management of the Forest. Forest-wide management guidelines apply to all areas of the Forest regardless of the other management prescriptions applied.
Full Service Management	Management of developed recreation facilities to provide optimum maintenance.

G

Game Species	Any species of wildlife or fish for which seasons and bag limits have been prescribed, and which are normally harvested by hunters, trappers, and fishermen under State or Federal laws, codes, and regulations.
General Forest	Commercial forest land that usually receives more than 25 inches of precipitation per year. Includes the following habitat types: Douglas fir/pinegrass, subalpine fir/twinflower, subalpine fir/blue huckleberry, subalpine fir/grouse whortleberry, subalpine fir/sweetscented bedstraw, subalpine fir/menziesia, and subalpine fir/pinegrass. The general forest is further subdivided into: (1) high (from 50 to 84 cubic feet) acre/year; and (2) low (from 20 to 49 cubic feet/acre/year.
Goals	A concise statement of the state or condition that a land and resource management plan is designed to achieve. A goal is usually not quantifiable and may not have a specific date for completion.
Goods and Services	The various outputs produced by forest and rangeland renewable resources, the tangible values of which are expressed in market and nonmarket terms.

Group Selection	A modification of the selection system in which trees are removed in small groups at a time.
Guideline	An indication or outline of policy or conduct.

H

Habitat Type	An aggregation of all land areas potentially capable of producing similar plant communities at climax.

I

Indicator Species	A species selected because its population changes indicate effects of management activities on the plant and animal community. A species whose condition can be used to assess the impacts of management actions on a particular area.
Indirect Effects	Effects caused by the action but which are later in time or farther removed in distance but still reasonably foreseeable.
Integrated Pest Management	Activities undertaken to control insect and disease infestations in tree stands, given consideration for other resource values.
Intensive Grazing	Grazing management that controls distribution of cattle and duration of use on the range, usually by fences, so parts of the range are rested during the growing season.
Intermittent Streams	A stream which flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas.
Interpretive Services	Visitor information services designed to present inspirational, educational, and recreational values to Forest visitors to provide the utmost in understanding, appreciation, and enjoyment from their Forest experience.
Inventory Data	That information on Forest resources such as soil, water, timber, wildlife, range, geology, minerals, and recreation that was used to determine the capability and opportunity of the Forest.
Issue	See Public Issue.

L

Land Exchange	The conveyance of non-Federal land or interests to the United States in exchange for National Forest System land or interests in land.
Land Line Location	Legal identification and accurate location of National Forest property boundaries.
Land Type	An area of land classified on the basis of gemorphic principles. An understanding of geologic processes (as reflected in land surface form and features), individual kinds of soil, and the factors which determine the behavior of ecosystems (i.e. climate, vegetation, relief, parent materials, and time) is used as the basis of this classification system.
Late Forest Succession	A stage of forest succession where the majority of trees are mature or overmature.
Leasable Minerals	See Minerals, Leasable.
Level I Fire Analysis	General fire management analysis to provide historical information that assists the interdisciplinary team in the analysis of the management situation and formulation of alternatives for the Forest Plan.
Level II Fire Analysis	An analytical process which guide the implementation of fire management activities of the Forest Plan.
Linear Programming	A mathematical method used to determine the most effective allocation of limited resources between competing demands when both the objective (e.g. profit or cost) and the restrictions on its attainment are expressible as a system of linear equalities or inequalities (e.g., $y=a+bx$).
Limited Surface Use	A mineral lease clause that recognizes an opportunity for occupancy but that requires further evaluation based on site specific proposals.
Livestock Use	Animals used primarily in conjunction with recreation such as horses and mules.
Local Dependent Industries	Industries relying on National Forest outputs for economic activity.

Local Roads	Roads constructed and maintained for, and frequented by, the activities of a given resource element. Some use may be made by other element activities, but normally maintenance is not affected by such use. These roads connect terminal facilities with Forest collector or Forest arterial roads or public highways. The location and standard usually are determined by the requirement of a specific resource activity rather than by travel efficiency. Forest local roads may be developed and operated for constant or intermittent service depending on land use and resource management objectives for the area served by the facility.
Locatable Minerals	See Minerals, Locatable.
Long-Term Sustained Yield Capacity	The highest uniform wood yield from lands being managed for timber production that may be sustained under a specified intensity of management consistent with multiple use objectives.

M

Management Action	Any activity undertaken as part of the administration of the Forest.
Management Area	An aggregation of capability areas having common management direction and may be non-contiguous in the Forest. Consists of a grouping of capability areas selected through evaluation procedures and used to locate decisions and resolve issues and concerns.
Management Concern	A problem requiring resolution, or a condition constraining management practices. These are identified by Forest Service personnel.
Management Direction	A statement of multiple use and other goals and objectives, the management prescriptions, and the associated standards and guidelines for attaining them.
Management Intensity	The relative cost of a possible management direction and/or management practice.
Management Opportunity	A statement of general actions, measures, or treatments that address a public issue or management concern in a favorable way.

Management Practice	A specific measure, action, or treatment.
Management Prescription	Management practices selected and scheduled for application in a specific area to attain multiple use and other goals and objectives.
Management Standards and Guidelines	See Standard and Guideline.
Maximum Resource Potential	The maximum possible output of a given resource limited only by its inherent physical and biological characteristics.
Mean Annual Increment	The total increase is girth, diameter, basal area, height, or volume of individual trees or a stand up to a given age divided by that age.
Mineral Development	The preparation of a proven deposit for mining.
Mineral Entry	The filing of a mining claim for public land to obtain the right to any minerals it may contain.
Mineral Entry Withdrawal	The exclusion of the right of possession of locatable mineral deposits by the locator on areas required for administrative sites by the Forest Service and other areas highly valued by the public. Public lands withdrawn from entry under the General Mining Laws and/or the mineral leasing laws.
Mineral Exploration	The search for valuable minerals on lands open to mineral entry.
Mineral Production	Extraction of mineral deposits.
Minerals, Leasable	Coal, oil, gas, phosphate, sodium, potassium, oil shale, sulphur (in Louisiana and New Mexico), and geothermal steam.
Minerals, Locatable	Those hardrock minerals which are mined and processed for the recovery of the minerals; often metallic. May include certain nonmetallic minerals and uncommon varieties of mineral materials such as valuable and distinctive deposits of limestone and silica. May include any solid, natural inorganic substance occurring in the crust of the earth, except for the common varieties of mineral materials and leasable minerals.
Mining Claims	That portion of the public estate held for mining purposes in which the right of exclusive possession of locatable mineral deposits is vested in the locator of a deposit.

Mitigate	To lessen the severity.
Monitoring and Evaluation	The periodic evaluation on a sample basis of Forest Plan management practices to determine how well objectives have been met and how closely management standards have been applied.
Montana Wilderness Study Act Areas	Those areas (Middle Fork Judith and Big Snowies) that are required to be studied for their wilderness suitability under the Montana Wilderness Study Act of 1978 (Public Law 95-1950).
Multiple Use	The management of all the various renewable surface resources of the National Forests to that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some lands will be used for less than all resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration given to the relative values of the various resources, and not necessarily the combination of the uses that will give the greatest dollar return, or the greatest unit output.

N

National Environmental Policy Act	An act to declare a National policy which will encourage productive and enjoyable harmony between man and his environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man, to enrich the understanding of the ecological systems and natural resources important to the Nation and to establish a Council on Environmental Quality.
National Forest Landscape Management System	The art and science of planning and administering the use of forest lands in such ways that the visual effects maintain or upgrade man's psychological welfare. It is the planning and design of the visual aspects of multiple use land management.
National Forest System Land	National Forests, National Grasslands, and other related lands for which the Forest Service is assigned administrative responsibility.

National Recreation Trails	Trails designated by the Secretary of the Interior or the Secretary of Agriculture as part of the national system of trails authorized by the National Trails System Act. National recreation trails provide a variety of outdoor recreation uses in a reasonably accessible to urban areas.
National Wilderness Preservation System	All lands covered by the Wilderness Act and subsequent wilderness designations, irrespective of the department or agency having jurisdiction.
NEPA	See National Environmental Policy Act.
NFMA	See National Forest Management Act.
No Action Alternative	The most likely condition expected to exist in the future if the current plan would continue unchanged.
Noncommodity Outputs	A resource output that cannot be bought and sold.
Nonconsumptive Use	Those uses of resources that do not reduce the supply. For example: Nonconsumptive uses of water include hydroelectric power generation, boating, swimming, etc.
Nondeclining Sustained Yield	A level of timber production planned so that the planned sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade.
Nongame	Species of animals which are not managed as a sport hunting resource.
No-Surface Occupancy Stipulation	A mineral lease clause that permits passive activities such as seismic exploration or directional drilling from adjacent areas, but prohibits the occupancy of the surface with road or drilling.

O

Objective	A specified statement of measurable results to be achieved within a stated time period. Objectives reflect alternative mixes of all outputs or achievements which can be attained at a given budget level. Objectives may be expressed as a range of outputs.
Off-Road Vehicle	Any vehicle capable of being operated off an established road or trail.

Old-Growth	A stand of trees that is past full maturity and showing decadence; the last stage in forest succession.
Operations Plan	A written plan, approved by a Forest Officer, prepared by those engaged in mining activity on the Forest prospecting, exploration, describing mining and mineral processing activities that will likely cause a significant disturbance of surface requirements.
Outputs	The goods, services, products, and concerns which are measurable and capable of being used to determine the effectiveness of programs and activities in meeting objectives. Also goods, end products, or services that are purchased, consumed, or utilized directly by people. A broad term for describing any result, product, or service that a process or activity actually produces.
Overmature Timber	Trees that have attained full development, particularly in height and are declining in vigor, health, and soundness.
Overstory	That portion of the Forest of more than one story forming the upper or uppermost canopy.

P

Particulates	Small particles suspended in the air and generally considered pollutants.
Patented Mining Claims	A patent is a document which conveys title to land. Whe patented, a mining claim becomes private property and is land over which the United States has no property rights, except as may be reserved in the patent. After a mining claim is patented, the owner does not have to comply with requirements of the General Mining Law or implementing regulations.
Permitted Grazing	Use of a National Forest range allotment under the terms of a grazing permit.
Planning Area	The area covered by a Regional or Forest Plan.
Planning Criteria	Standards, tests, rules, and guidelines by which the planning process is conducted and upon which judgments and decisions are based.

Planning Period	The 50-year time frame (1980-2030) for which goods, services, and effects were projected in the development of the Forest Plan.
Planning Records	A system that records decisions and activities that result from the process of developing a Forest Plan, revision, or significant amendment.
Policy	A guiding principle upon which is based a specific decision or set of decisions.
Practice	See Management Practice.
Precommercial Thinning	The selective felling, deadening, or removal of trees in a young stand primarily to accelerate diameter increment on the remaining stems, maintain a specific stocking or stand density range, and improve the vigor and quality of the trees that remain. This practice is also important for lowering stand susceptibility to mountain pine beetle.
Preparatory Cut	Removal of trees near the end of a rotation so as to permanently open the canopy and enlarge the crowns of seed bearers, with a view to improving conditions for seed production and natural regeneration, as typically in shelterwood systems.
Present Net Value (PNV)	Discounted benefits less discounted costs associated with providing all resource outputs to which monetary value can be assigned, including both market and selected nonmarket outputs.
Prescribed Fire	The intentional application of fire to wildland fuels in either their natural or modified state under such conditions as allow the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to further certain planned objectives (i.e. silviculture, wildlife management).
Prescription	See Management Prescription.
Presuppression	Activities required in advance of fire occurrence to ensure effective suppression action. Includes 1) recruiting and training fire forces; 2) planning and organizing attack methods; 3) procuring and maintaining fire equipment; and 4) maintaining structural improvements necessary for the fire program.

Primitive Recreation Setting	A classification of the recreation opportunity spectrum that characterizes an essentially unmodified natural environment of a size or remoteness that provide significant opportunity for isolation from the signs and sounds of man and a feeling of vastness of scale. Visitors have opportunity to be part of the natural environment, encounter a high degree of challenge and risk, and use a maximum of outdoor skills but have minimum opportunity for social interaction.
Production Potential	The capability of the land or water to produce live-sustaining features (forage, cover, aquatics).
Productivity	See Site Productivity.
Program Development and Budgeting	The process by which activities for the Forest are proposed and funded.
Proposed Action	In terms of the National Environmental Policy Act, the project, activity, or action that a Federal agency intends to implement or undertake and is the subject of an environmental assessment.
Public Access	Usually refers to a road or trail route over which a public agency claims a right-of-way available for public use.
Public Issue	A subject or question of widespread public interest relating to management of National Forest System lands identified through public participation.

R

Range Allotment	A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under a range allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System and associated lands administered by the Forest Service.
Range Condition	The state of health of the range based on what it is naturally capable of producing.
Ranger District	Administrative subdivisions of the Forest supervised by a District Ranger who reports to the Forest Supervisor.
RARE II	See Roadless Area Review and Evaluation II.

Research Natural Area	An area is as near condition as possible, which exemplifies typical or unique vegetation and associated biotic, soil, geologic, and acquatic features. The area is set aside to preserve a representative sample of an ecological community primarily for scientific and educational purposes; commercial and general public use is not allowed.
Record of Decision	A document separate from but associated with an environmental impact statement that publicly and officially discloses the responsible official's decision on the proposed action.
Recreation Capacity	The number of people that can take advantage of the supply of recreation opportunity without substantially diminishing the qualtiy of the experience sought after.
Recreation Opportunity Guide	A catelogue describing the recreation activities available on a particular Ranger District.
Recreation Residence	House or cabins on National Forest land that are not the primary residence of the owner.
Recreation Opportunity Spectrum	A system for planning and managing recreation resources that recognizes recreation activity opportunity, recreation setting opportunity, and recreation experience opportunity along a spectrum or continuum.
Recreation Types - Developed Recreation	Developed Recreation - The type of recreation that occurs where modifications (improvements) enhance recreation opportunities and accommodate intensive recreation activities in a defined area.
	Dispersed Recreation - That type of recreation use that requires few if any improvements and may occur ocer a wide area. Involves activities related to roads and trails. The activities do not necessarily take place on or adjacent to a road or trail, only in conjunction with it. Activities tend to be day-use oriented and include hunting, fishing, berrypicking, off-road vehicle use, hiking, horseback riding, picniking, camping, viewing scenery, snowmobiling, and many others.
Recreation Visitor Day (RVD)	One visitor day equals 12 hours (one person for 12 hours, or 12 people for 1 hour, or any combination thereof).
Reduced Service Management	Management of developed recreation facilities below established maintenance standards.

Reforestation	The setting out of seedlings, transplants, tree seeds, or for certain species, cuttings for the establishment of a forest stand or tree cover.
Regeneration	The renewal of a tree crop, whether by natural or artificial means.
Regional Forester	The official responsible for administering a single Region.
Regional Land and Resource Management Plan	The plan developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended, that guides all natural resource management activities and establishes management standards and guidelines for the National Forest System lands of a given Region. It also disaggregates the RPA objectives assigned to the Region to the Forests within that Region.
Regulated	The commercial forest land that is organized for timber production under the principle of sustained yield. The harvest of timber from this land will be regulated to achieve multiple long range objectives such as maintaining setting for recreational activities, rotating forage production areas and wildlife habitat, increasing water yield, and increasing the growth and utilization of timber for the Nation's supply.
Regulations	36 CFR refers to the Code of Federal Regulations for implementing the National Forest Management Act.
Resource Allocation Model	A mathematical model using linear programming which will allocate land to prescriptions and schedule implementation of those prescriptions simultaneously. The end purpose of the model is to find a schedule and allocation that meets the goals of the Forest and optimizes some objective function such as "minimum costs".
Right-of-Way	Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project facility passing over, upon, under, or through such land.
Riparian	Land areas which are directly influenced by water. Usually have visible vegetative or physical characteristics showing this water influence. Streamsides, lake borders, or marshes are typical riparian areas.

Roadless Area Review and Evaluation (RARE) II	The assessment of "primitive" areas within the National Forests as potential wilderness areas as required by the Wilderness Act. This refers to the second such assessment which was documented in the final environmental impact statement of the Roadless Area Review and Evaluation, January 1979.
Road Management	The administrative decisions on the location and timing of road and trail closures.
Roaded Natural Appearing Recreation Setting	A classification of the recreation opportunity spectrum where timber harvest or other surface use practices are evident. Motorized vehicles are permitted on all or parts of the road system.
Rotation	The planned number of years between the formation or regeneration of a crop or stand and its final cutting at a specified stage of maturity.
RPA	See Forest and Rangeland Renewable Resources Planning Act.
RPA Program	The recommended direction for long-range management of renewable resources of National Forest System lands. This direction serves as the basis for the Regional targets assigned to the Forest. The development of this direction is required by the Forest and Rangeland Renewable Resources Planning Act.
Rural Recreation Setting	A classification of recreation opportunity spectrum that is characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high.

S

Salvage	The exploitation of trees that are dead, dying, or deteriorating (e.g. because overmature or materially damaged by fire, wind, insects, fungi, or other injurious agencies) before their timber becomes worthless.
Sanitation	The removal of dead, damaged, or susceptible trees, essentially to prevent the spread of pests or pathogens and so promote forest hygiene.
Sawtimber	Trees suitable in size and quality for producing logs that can be processed into lumber. For planning purposes on the Forest, trees with a 7-inch diameter were classified as sawtimber.

Scenic Easement	An interest in the land of another which allows the easement holder specified uses or rights without actual ownership of the land; in this case, control of the use of land adjacent to public highways, parks, and rivers. It may provide something attractive to look at within the easement area, an open area to look through to see something attractive beyond the easement itself, or a screen to block out an unsightly view beyond the easement area.
Scoping Process	The public and management activities used to determine the range of actions, alternatives, and impacts to be considered in an environmental impact statement.
Sediment	Solid material, both mineral and organic, that is in suspension, being transported, or has been moved from its site of origin by air, water, gravity, or ice.
Seed Cut	Removal of trees in a mature stand so as to affect permanent opening of its canopy (if there is no preparatory cutting to do this) and so provide conditions for securing regeneration from the seed of trees retained for that purpose; the first of the shelterwood cuttings under a shelterwood system.
Seedling/Sapling	A forest successional stage in which trees less than 5 inches in diameter are the predominant vegetation.
Seismic Methods	Seismic exploration is used to map underground geological features to obtain more reliable information on the earth's subsurface and to localize areas where accumulations of oil and gas might occur. Seismic waves, generated at or near the surface, penetrate the earth's crust and reflect from subsurface rock layers back to the surface. The geophysicist receives a printed record or seismograph from which is measured the depth to various strata and from which subsurface structures with a potential for oil and gas accumulation such as faults, anticlines, and folds can be determined.
Portable	Where access limitations, topography, or other restraints prevent use of trucks, portable operations can be performed. Two portable techniques exist for collecting data.

These are:

(1) Surface charge programs involve the detonation of a series of as much as 50 to 100 pounds of explosives at shot points located at intervals along the seismic line. Surface charges can be placed directly on the ground, on snow, or on a variety of stakes or platforms. All necessary equipment to conduct the operation is transported by helicopters and then conveyed by foot travel.

(2) Various kinds of portable drills can be backpacked or delivered by helicopter to the area. A shallow subsurface portable program would involve drilling a pattern of approximately 16 holes about 4 inches in diameter up to 50 feet deep per mile of line. At this depth, a 10 to 40 pound charge of explosive is placed and detonated. Recording cables and geophones are laid out by foot travel.

With both of these portable techniques, shock waves generated by detonation are received and transmitted via geophones and cable to a recording device. Portable methods are generally used on the Forest.

Conventional

The conventional method of collecting seismic data includes the use of truck mounted drills and vehicle-supported crews which generally involves off-road vehicle travel. This technique involves drilling 5 to 18 (generally 6) 5-inch diameter holes per mile to a depth of 180 to 200 feet. At this depth a 10 to 100 (generally 25 to 50) pound charge of explosive is placed and detonated. Shock waves are received and transmitted via geophones and cable to a truck-mounted recording device. Due to terrain restrictions, this method has limited application on the Forest.

Vibroseis

The vibroseis technique involves using truck-mounted hydraulic pads which generate energy waves through vibration rather than explosives. The vibrator method typically consists of four large trucks each equipped with a vibrator (a steel slab weighing about three tons) mounted between the front and back wheels. The vibrator pads (about four feet square) are lowered to the ground and vibrators on all trucks are triggered electronically from the recorder truck. Energy waves are received and transmitted via cable and geophones to a recorder truck. After the information is

	recorded, the trucks move forward a short distance and the process is repeated. The vibroseis operation is usually limited to roads and gentle terrain.
Gravity	Gravity surveys generally involve vehicle supported operations in which gravity-density variations are measured by use of surface instruments. These surveys are also usually limited to roads and gentle terrain.
Selection Cutting	The annual or periodic removal of trees (particularly the mature), individually or in small groups from an uneven-aged forest in order to realize the yield and establish a new crop of irregular constitution.
Semi-Primitive Recreation Setting	A classification of recreation opportunity spectrum that characterizes a predominantly natural or natural appearing environment of a moderate to large size. Concentration of users is low, but there is often evidence of other area users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle.
Silvicultural Systems	A combination of interrelated actions whereby forests are tended, harvested, and replaced. The combination of management practices used to manipulate the vegetation results in forests of distinctive form and character, and this determines the combination of multiple resource benefits that can be obtained. Systems are classified as even-aged and uneven-aged.
Site Preparation	A general term for removing unwanted vegetation, slash, and even roots and stones from a site before reforestation.
Site Productivity	Production capability of specific areas of land.
Slash	The residue left on the ground after felling and other silvicultural operations and/or accumulating there as a result of storm, fire, girdling, or poisoning.
Small Game	Birds and small mammals normally hunted or trapped.
Snag	Standing dead tree larger than 6 inches in diameter at breast height.

Soil Productivity	The capacity of a soil to produce a specific crop such as fiber and forage, under defined levels of management. It is generally dependent on available soil moisture and nutrients and length of growing season.
Special Use Permit	A permit issued under established laws and regulations to an individual, organiztion, or company for occupancy or use of National Forest land for some special purpose.
Stagnation	A condition where plant growth is markedly reduced or even arrested through, i.e., competition, state of the soil, or disease.
Standard	A principle requiring a specific level of attainment, a rule to measure against.
Stipulations	The requirements or clauses of a minimal lease.
Subdivisions	Areas of previously undeveloped land divided into individual homesites and/or blocks of lots with streets or roads and open spaces.
Successional Stage	A phase in the gradual supplanting of one community of plants by another.
Suitability	The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.
Suitable (Technically) Land	Technology is available that will ensure timber production from the land without irreversible resource damage to soils, productivity, or watershed conditions. There is reasonable assurance that such lands can be adequately restocked as provided in CFR 219.13(h)(3).
Suppression	All the work of extinguishing or confining a fire, beginning with its discovery.

T

Targets	Objectives assigned to the Forest by the Regional Plan.

Threatened Species	Those plant or animal species identified by the Secretary of Interior as threatened in accordance with the 1973 Endangered Species Act.
Three-Step Shelterwood	An even-aged silvicultural system in which in order to provide a source of seed and/or protection for regeneration, the old crop (the shelterwood) is removed in three successive cuttings.
Tiering	Refers to the coverage of general matters in broader environmental impact statements (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional or basinwide program statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared.
Timber	A general term for the major woody growth of vegetation in a forest area.
Timber Base	The lands within the Forest capable, available, and suitable for timber production.
Timber Harvest Schedule	The quantity of timber planned for sale and harvest, by time period, from the area of land covered by the Forest Plan. The first period, usually a decade, of the selected harvest schedule provides the allowable sale quantity. Future periods are shown to establish that sustained yield will be achieved and maintained.
Timber Production	The growing, tending, harvesting, and regeneration of regulated crops of industrial wood. Industrial wood includes logs, bolts, or other round sections cut from trees for industrial or consumer use, except fuelwood.
Timber Stand Improvements (TSI)	A loose term comprising all intermediate cuttings made to improve the composition, constitution, condition, and increment of a timber stand.
Trailheads	The parking, signing, and other facilities available at the terminus of a trail.
Transitory Range	Land that is suitable for grazing use of a nonending nature over a period of time. For example, on particular disturbed lands, grass may cover the area for a period of time before being replaced by trees or shrubs not suitable for forage.

Tree Opening	An opening in the forest cover created by the application of even-aged silvicultural practices.
Trespass	The act of going on another's land or property unlawfully.
Two-Step Shelterwood	An even-aged silvicultural system in which, in order to provide a source of seed and/or protection for regeneration, the old crop (shelterwood) is removed in two successive cuttings.

U

Understory	The trees and other woody species growing under a more or less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth.
Uneven-aged Silviculture	The combination of actions that result in the creation of forests in which trees of several or many ages may grow together. Individual Tree Selection Cutting - Involves the removal of selected trees of all size classes on an individual basis. Group Selection Cutting - Involves the removal of selected trees of all size classes in groups of a fraction of an acre up to 2 or 3 acres in size.
Utilization Standards	Standards guiding the use and removal of timber. They are measured in terms of diameter at breast height (d.b.h.) and type of the tree inside the bark (top d.i.b.) and percent "soundness" of the wood.

V

Vegetation Treatment	Any activities undertaken to modify the existing condition of the vegetation.
Viable Populations	A wildlife or fish population of sufficient size to maintain its existence over time in spite of norma fluctuations in population levels.
Visual Quality Objectives (VQO)	A desired level of excellence based on physical and sociological characteristics of an area. Refers to the degree of acceptable alteration of the characteristic landscape.

	Retention (R) - In general, man's activities are not evident to the casual forest visitor.
	Partial Retention (PR) - In general, man's activities may be evident but must remain subordinate to the characteristic landscape.
	Modification (M) - Man's activity may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in middleground or background.
Visual Resource	The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

W

Water Yield	The measured output of the Forest's streams.
Wilderness	Under the 1964 Wilderness Act, wilderness is undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation. It is protected and managed so as to preserve its natural conditions which 1) generally appear to have been affected primarily by the forces of nature with the imprint of man's activity substantially unnoticeable; 2) has outstanding opportunities for solitude or a primitive and confined type of recreation; 3) has at least 5,000 acres or is of sufficient size to make practical its preservation, enjoyment, and use in an unimpaired condition, and 4) may contain features of scientific, educational, scenic, or historical value as well as ecologic and geologic interest.
Withdrawal	An order removing specific land areas from availability for certain uses.
Work Year Equivalents	Approximately 2,000 working hours. May be filled by one person working yearlong or several people filling seasonal positions.

APPENDIX C

DEIS LEWIS AND CLARK NATIONAL FOREST PLAN

FORPLAN PRESCRIPTIONS

PRESCRIPTIONS USED IN THE FORPLAN MODEL

All management prescriptions developed by the interdisciplinary team were integrated resource management prescriptions.

Each prescription is a group of compatible management practices, where these management practices represent a specific action or treatment of each resource element. Further information and descriptions of the management practices and prescriptions can be found in the planning records at the Lewis and Clark National Forest Supervisor's Office.

The following prescriptions were used in the FORPLAN model. They are grouped by the main management emphasis of each management prescription. This description of the emphasis describes only the main emphasis of the management prescription, although management for other resources is provided in each prescription.

Minimum Level Management	All lands except wilderness and wilderness study.
LLAC0	Management emphasis is at a low intensity level for both market and nonmarket values which allows only a maintenance level for recreation and wildlife.
SRZ01	Management of riparian zones to protect or enhance unique resource values.
SXF01	Management of Tenderfoot Experimental Forest for research objectives.
SNA00	Management of Research Natural Areas. Recreation setting will be semi-primitive.
Range Management	Lands available and capable for producing livestock forage.
LLACD	Management emphasis is at a low intensity level for both market and nonmarket values which allows only a maintenance level for recreation, wildlife, and range.
HLD04	Management emphasis is on range management at a high intensity level. Recreation setting is roaded natural appearing.
HLD05	Management emphasis is on range management at a high intensity level. Recreation setting is semi-primitive.
SRZD1	Management of riparian zones to protect or enhance unique resource values. Range management is permitted.

Timber Management	Lands available and capable for producing commercial timber.
MLE01	Management emphasis is on timber management at a moderate intensity level. Harvest and regeneration system is clearcutting. Recreation setting is roaded natural appearing.
MLE02	Management emphasis is on timber management at a moderate intensity level. Harvest and regeneration system is shelterwood. Recreation setting is roaded natural appearing.
HLE01	Management emphasis is on timber management at a high intensity level. Harvest and regeneration system is clearcutting. Recreation setting is roaded natural appearing.
HLE02	Management emphasis is on timber management at a high intensity level. Harvest and regeneration system is shelterwood. Recreation setting is roaded natural appearing.
HLE03	Management emphasis is on timber management at a high intensity level. Harvest and regeneration system is selection. Recreation setting is roaded natural appearing.
SRZE1	Management of riparian zone to protect or enhance unique resource values. Timber management is permitted but must be in accordance with riparian guidelines.
Timber/Range Management	Lands available and capable of producing livestock forage and commercial timber.
MLED1	Management emphasis is on timber and range management at moderate intensity levels. Harvest and regeneration system is clearcutting. Recreation setting is roaded natural appearing.
MLED2	Management emphasis is on timber and range management at moderate intensity levels. Harvest and regeneration system is shelterwood. Recreation setting is roaded natural appearing.
HLED1	Management emphasis is on timber management at high intensity levels. Harvest and regeneration system is clearcutting. Recreation setting is roaded natural appearing.

Timber/Range Management (Continued)

HLED2	Management emphasis is on timber and range management at high intensity levels. Harvest and regeneration system is shelterwood. Recreation setting is roaded natural appearing.
HLED3	Management emphasis is on timber and range management at high intensity levels. Harvest and regeneration system is selection. Recreation setting is roaded natural appearing.
SRZED	Management of riparian zones to protect or enhance unique resource values. Range and timber management are permitted but must be in accordance with riparian guidelines.
Timber/Wildlife/ Visual Management	Lands available and capable of producing commercial timber.
MME01	Management emphasis is on timber management at a moderate intensity level while also emphasizing dispersed recreation and wildlife at moderate intensity levels. Harvest and regeneration system is clearcutting over a lengthened rotation. Recreation setting is roaded natural appearing.
MME02	Management emphasis is on timber management at a moderate intensity level while also emphasizing dispersed recreation and wildlife at moderate intensity levels. Harvest and regeneration system is shelterwood over a lengthened rotation. Recreation setting is roaded natural appearing.
MME03	Management emphasis is on timber management at a moderate intensity level while also emphasizing dispersed recreation and wildlife management at moderate intensity levels. Harvest and regeneration system is selection. Recreation setting is roaded natural appearing.
Timber/Range/Wildlife Visual Management	Lands available and capable of producing livestock forage and commercial timber.
MMED1	Management emphasis is on timber and range management at moderate intensity levels while also emphasizing dispersed recreation and wildlife management at moderate intensity levels. Harvest and regeneration system is clearcutting with a lengthened rotation. Recreation setting is roaded natural appearing.

Timber/Range/Wildlife Visual Management (Continued)

MMED2	Management emphasis is on timber and range management at moderate intensity levels while also emphasizing dispersed recreation and wildlife management at moderate intensity levels. Harvest and regeneration system is shelterwood with a lengthened rotation. Recreation setting is roaded natural appearing.
MMED3	Management emphasis is on timber and range management at moderate intensity levels while also emphasizing dispersed recreation and wildlife management at moderate intensity levels. Harvest and regeneration system is selection. Recreation setting is roaded natural appearing.
Wildlife Management	All lands except wilderness.
LHC08	Management emphasis is on wildlife management at a high intensity level. Recreation setting is semi-primitive.
LHA08	Management emphasis is on wildlife management and dispersed recreation at a high intensity level. Recreation setting is semi-primitive.
Wildlife/Range Management	Lands available and capable of producing livestock forage.
LHC05	Management emphasis is on wildlife management at a high intensity level. Range management is permitted. Recreation setting is semi-primitive.
LHA05	Management emphasis is on wildlife management and dispersed recreation at a high intensity level. Range management is permitted. Recreation setting is semi-primitive.
MMD04	Management emphasis is on range management at a moderate intensity level while also emphasizing dispersed recreation and wildlife management at moderate intensity levels. Recreation setting is roaded natural appearing.
MMD05	Management emphasis is on range management at a moderate intensity level while also emphasizing dispersed recreation and wildlife management at moderate intensity levels. Recreation setting is semi-primitive.

Wilderness Management	Wilderness and recommended wilderness lands.
SWMO1	Management of classified wilderness at a high level with investment intensities being limited to trails construction. Fire management through full suppression techniques.
SWMD1	Management of classified wilderness at a high level with limited investment allowed in range management as well as trails construction. Fire management is through modified suppression techniques permitting the use of prescribed fire from unplanned ignitions.
SWMO2	Management of classified wilderness at a low level with limited investment allowed in trails construction. Fire management is through modified suppression techniques permitting the use of prescribed fire from unplanned ignitions.
SWMD2	Management of classified wilderness at a low level with limited investment allowed in range management as well as trails construction. Fire management is through modified suppression techniques permitting the use of prescribed fire from unplanned ignitions.
SWMD3	Management of classified wilderness at a low level with limited investment allowed for dispersion of livestock and trails construction. Fire management is through modified suppression techniques permitting the use of prescribed fire from unplanned ignitions.
Wilderness Study	MWSA areas and RARE II further planning lands.
SWSO1	Interim management of wilderness study areas: MWSA and RARE II further planning areas in a semi-primitive recreation setting.
SWSD1	Interim management of wilderness study areas: MWSA and RARE II further planning areas in a semi-primitive recreation setting. Range management is permitted.
Developed Recreation Management	Campgrounds, ski areas.
SCMO1	Management of developed recreation sites with management at full service levels.

Developed Recreation Management (Continued)

SCM02	Management of developed recreation sites with management at a reduced service level.
SCM03	Management developed recreation sites with management at low reduced service level.
SCN01	Construction of new developed recreation sites or upgrading or expansion of existing sites with subsequent management at full service level.
SNC02	Construction of new developed recreation sites or upgrading or expansion of existing sites with subsequent management at reduced service level.
Concentrated Recreation Management	Lands adjacent to major roads, campgrounds, and ski areas.
SRN01	Management of concentrated dispersed recreation areas.
SRND1	Management of concentrated dispersed recreation areas. Some range management is permitted.
SRNE1	Management of concentrated dispersed recreation areas. Some timber management is permitted.
SRNED	Management of concentrated dispersed recreation areas. Some range and timber management is permitted.

APPENDIX D

DEIS LEWIS AND CLARK NATIONAL FOREST PLAN

SUMMARY OF FORPLAN BENCHMARKS AND ALTERNATIVES

SUMMARY OF FORPLAN BENCHMARKS AND ALTERNATIVES

All benchmarks and alternatives include values or were adjusted to include values for recreation, range, timber, and oil and gas leasing. All benchmarks and alternatives have maximize PNV as the objective function unless otherwise noted.

<table>
<tr><th>Benchmarks</th><th>Constraints</th><th>Assumptions</th></tr>
<tr><td>Minimum Level
RUN ID:
115MLA</td><td>-Limited to three prescriptions: minimum level, wilderness study, and wilderness management.</td><td>-No investment practices allowed.
-Existing timber sales and grazing permits phased out by the end of Decade 1.</td></tr>
<tr><td>Maximum Present Net Value
RUN ID:
115MTA</td><td>-Ending Inventory Constraint
-Timber harvest levels constrained to local mill capacity 1st Decade thereafter increases are limited to 20% and decreases limited to 30% of the timber harvest volume of the previous decade.
-Timber harvest volume constrained to be 80% or greater of current level.
-Only 20% of each analysis area allowed to be accessed for timber harvesting first 5 decades.</td><td>-Wilderness, recommended wilderness, and Deep Creek/Reservoir North were not available for harvest.
-No budget constraint.
-Effects on soil and water mitigated through accessibility constraints.</td></tr>
<tr><td>Maximum Timber
RUN ID:
115MTA</td><td>-Same as Maximum PNV.
-Constraints for timber:
<table>
<tr><th>Decade</th><th>Timber (Million Cu. Ft.)</th></tr>
<tr><td>1</td><td>7.1</td></tr>
<tr><td>2</td><td>9.2</td></tr>
<tr><td>3</td><td>11.9</td></tr>
<tr><td>4</td><td>15.5</td></tr>
<tr><td>5</td><td>20.2</td></tr>
<tr><td>6</td><td>26.2</td></tr>
<tr><td>7</td><td>25.6</td></tr>
<tr><td>8</td><td>20.5</td></tr>
<tr><td>9</td><td>16.4</td></tr>
<tr><td>10</td><td>13.1</td></tr>
<tr><td>11</td><td>10.5</td></tr>
<tr><td>12</td><td>12.7</td></tr>
<tr><td>13</td><td>16.5</td></tr>
<tr><td>14</td><td>21.5</td></tr>
<tr><td>15</td><td>27.9</td></tr>
</table></td><td>-Same as Maximum PNV, plus:
-This run was initially done with maximum timber as the objective function; the timber outputs were used as constraints for a second run where the objective function was maximize PNV</td></tr>
</table>

Benchmarks	Constraints	Assumptions
Maximum Range RUN ID: 115MRA	-Same as maximum PNV except no timber harvest floor was used. -Range production set above 80% of current level. -Constraints for range: Decade — AUMs 1 — 90,000 2 — 90,000 3 — 90,000 4 — 90,000 5 — 90,000	-Same as Maximum PNV, plus: -Domestic livestock forage maximized and, after the allocation was adjusted to reflect grazing on only suitable grazing lands, was rerun with the range outputs used as constraints. The objective function was to maximize PNV.
Maximum Elk RUN ID: 115MEA	-Same as Maximum PNV except timber harvest held to 12.5 million board feet or less per year. -Habitat of wildlife was constrained to have elk population at 80% or greater than current level.	-Same as Maximum PNV, plus: -No livestock grazing on winter range and reduced grazing level in riparian zones. -Maximization of PNV was done after maximizing big game winter forage - this forage level was used as a constraint for the second run.

ALTERNATIVES - All alternatives contained management emphasis and intensity constraints for visual concerns; also inventory constraints were used to track acres in grass/forb stage and in old growth stage.

Alternatives | Constraints | Assumptions

Current Plan

RUN ID:
115CDB

-Ending inventory constraint.
-Nondeclining sustained yield.
-Output constraints (annual):

Decade	Timber Million Cu. Ft.	Range (AUMs)
1	3.8	77280
2	3.8	77280
3	3.8	77280
4	3.8	77280
5	3.8	77280

Decade	Wildlife (A.E.)	Budget (Million $)
1	2170	2.55
2	2170	2.55
3	2170	2.55
4	2170	2.55
5	2170	2.55

-Wilderness, recommended wilderness, and further planning areas are not available for timber harvest.

-Present level of outputs in the past 5 years is assumed to continue for the next 15 decades.

Alt. A-1

RUN ID:
115MXW

-Ending inventory constraint.
-Nondeclining sustained yield.
-Output constraints (annual):

Decade	Timber Million Cu. Ft.	Range (AUMs)
1	5.9	73000
2	8.8	75500
3	10.0	81500
4	10.9	84500
5	12.1	86400

Decade	Wildlife (A.E.)	Budget (Million $)
1	5490	4.7
2	5490	4.7
3	5480	4.7
4	5480	4.7
5	5370	4.7

-Wilderness, recommended wilderness, and further planning areas are not available for timber harvest.
-MWSA areas considered as wilderness.
-RPA targets used as scheduled output constraints.

Alternatives — Constraints — Assumptions

Alt. A-2

RUN ID:
115MXC

-Same as Alternative A-1 except range and wildlife constraints:

Decade	Range (AUMs)	Wildlife (A.E.)
1	72800	5920
2	76200	5920
3	82230	5910
4	85360	5900
5	87500	5860

-Same as Alternative A-1 except MWSA areas are available for harvest.

Alt. B-1

RUN ID:
115EDW

-Ending Inventory Constraint
-Nondeclining sustained yield
-Output constraints (annual):

Decade	Timber Million Cu. Ft.	Range (AUMs)
1	4.1	72700
2	5.4	75000
3	6.0	77850
4	6.4	79500
5	7.0	81350

Decade	Wildlife (A.E.)	Budget (Million $)
1	1980	2.7
2	1970	2.7
3	1960	2.7
4	1930	2.95
5	1890	3.05

-Wilderness, recommended wilderness, and further planning areas not available for timber harvest.
-MWSA areas considered as wilderness.
-Range and timber outputs increased to a moderate level.

Alt. B-2

RUN ID:
115EDB

-Same as Alternative B-1 except for range and wildlife constraints:

Decade	Range (AUMs)	Wildlife (A.E.)
1	72700	2060
2	75000	2060
3	78000	2050
4	80000	2050
5	81500	2040

-Same as Alternative B-1 except MWSA areas are available for timber harvest.

Alternatives Constraints Assumptions

Alt. C

RUN ID:
115ACB

- Ending inventory constraint.
- Nondeclining sustained yield.
- Output constraints (annual):

Decade	Timber (Million Cu. Ft.)	Range (AUMs)
1	3.7	72000
2	3.7	71420
3	3.7	71420
4	3.7	71420
5	3.7	71420

Decade	Wildlife (A.E.)	Budget (Million $)
1	5820	2.55
2	5820	2.55
3	5820	2.55
4	5820	2.55
5	5820	2.55

- Wilderness, recommended wilderness, and further planning areas not available for timber harvest.
- MWSA areas managed as semi-primitive recreation settings (not available for timber harvest).
- Management for maintaining and improving wildlife habitat emphasized.

Alt. D

RUN ID:
115ADB

- Ending inventory constraint.
- Nondeclining sustained yield.
- Output constraints (annual):

Decade	Timber (Million Cu. Ft.)	Range (AUMs)
1	3.7	73000
2	3.7	77000
3	3.7	83000
4	3.7	83000
5	3.7	89900

Decade	Wildlife (A.E.)	Budget (Million $)
1	2100	2.6
2	2100	2.6
3	2100	2.6
4	2080	2.6
5	2040	2.6

- Wilderness, recommended wilderness, and Deep Creek/Reservoir North further planning area not available for timber harvest.
- MWSA Big Snowy area managed for semi-primitive recreation (not available for timber harvest).
- MWSA Middle Fork Judith River area managed partly as semi-primitive recreation area (53,760 acres, no timber harvesting allowed) and roaded natural appearing recreation setting (38,240 acres, of which 12,000 acres are available for timber harvesting).
- Range outputs and semi-primitive recreation settings emphasized.

Alternatives | Constraints | Assumptions

Alt. E-1

RUN ID:
115CEW

-Ending inventory constraint.
-Nondecling sustained yield.
-Output constraints (annual):

Decade	Timber (Million Cu. Ft)	Range (AUMs)
1	4.1	72700
2	5.0	74000
3	6.7	79500
4	8.3	82000
5	9.7	84370

Decade	Wildlife (A.E.)	Budget (Million $)
1	3320	3.5
2	3320	3.5
3	3310	3.5
4	3260	3.5
5	3230	3.7

-Wilderness, recommended wilderness, and further planning areas for timber harvest.
-MWSA areas managed as wilderness.
-Wildlife emphasized on Rocky Mountain Division; range and timber emphasized on Jefferson Division.

Alt. E-2

RUN ID:
115CEB

-Same as Alternative E-1 except for range and wildlife constraints:

Decade	Range (AUMs)	Wildlife (A.E.)
1	72700	3410
2	74000	3400
3	79800	3390
4	82000	3340
5	84670	3270

-Same as Alternative E-1 except MWSA areas available for timber harvest.

Alternatives | Constraints | Assumptions

Alt. F (Preferred)

RUN ID: 115PAD

Constraints:

-Ending inventory constraint.
-Nondeclining sustained yield.
-Output constraints (annual).

Decade	Timber (Million Cu. Ft.)	Range (AUMs)
1	4.1	72600
2	5.0	73780
3	5.9	75490
4	6.8	77260
5	7.1	79200

Decade	Wildlife (A.E.)	Budget (Million $)
1	3250	3.4
2	3230	3.4
3	3230	3.4
4	3210	3.4
5	3150	3.4

Assumptions:

-Wilderness, recommended wilderness, and Deep Creek/Reservoir North not available for timber harvest.
-MWSA Big Snowy area managed as semi-primitive recreation area.
-MWSA Middle Fork Judith River area managed partly a semi-primitive recreation area (67,840 acres, no timber harvesting allowed) and roaded natural appearing recreation setting (24,160 acres, of which 13,312 acres are available for timber harvesting).
-Timber harvesting concentrated in presently roaded areas.
-Timber and range outputs increase moderately; semi-primitive recreation emphasized.
-Harvesting of lodgepole pine emphasized in Little Belts to mitigate losses from mountain pine beetle.

Alt. F (Departure)

RUN ID: 115PAI

Constraints:

-Ending inventory constraint.
-Nondeclining sustained yield contraint after fifth decade.
-All outputs same as Alternative F (Preferred) except for increases and decreases allowed in timber harvest volume.

Assumptions:

-Same as Alternative F (Preferred) except timber harvest volume allowed to increase and decrease by 20% each of first five decades.
